

**State:** Pennsylvania  
**TOI/Sub-TOI:** LTC03I Individual Long Term Care/LTC03I.001 Qualified  
**Product Name:** Long-Term Care  
**Project Name/Number:** MassMutual LTC Rate Increase Filing/145MML01-10.05  
**Filing Company:** Massachusetts Mutual Life Insurance Company

## Filing at a Glance

Company: Massachusetts Mutual Life Insurance Company  
Product Name: Long-Term Care  
State: Pennsylvania  
TOI: LTC03I Individual Long Term Care  
Sub-TOI: LTC03I.001 Qualified  
Filing Type: Rate - Other (Not M.U. or G.I. Product)  
Date Submitted: 11/30/2021  
SERFF Tr Num: MILL-132937942  
SERFF Status: Closed-Approved  
State Tr Num: MILL-132937942  
State Status: Approved  
Co Tr Num: MASSMUTUAL  
Effective: On Approval  
Date Requested:  
Author(s): John Hebig, Alex Moore, Jack Bridges, Cassi Noel, Megan Anderson, Rylee Sevigny, Lola Heimlich, Blake Wacholz, Cole Miggler, Howard Deng, Jamie Quinn, Andrew Herder  
Reviewer(s): Michael Hibbert (primary), Jim Lavery  
Disposition Date: 10/14/2022  
Disposition Status: Approved  
Effective Date:

### State Filing Description:

Proposed aggregate 35.8% increase on 4,964 policyholders of Mass Mutual forms MM-200-P-PA, MM-201-P-PA, MM-202-P-PA, MM-203-P-PA, MM-200-P-1-PA, MM-201-P-1-PA, MM-202-P-1-PA, MM-203-P-1-PA, MM-400-P-PA, MM-401-P-PA, MM-402-P-PA, MM-403-P-PA, MM-404-P-PA, MM-405-P-PA, MM500-P-PA, MM502-P-PA, MM500-P-1-PA, and MM502-P-1-PA.

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<b>State:</b>	Pennsylvania	<b>Filing Company:</b>	Massachusetts Mutual Life Insurance Company
<b>TOI/Sub-TOI:</b>	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
<b>Product Name:</b>	Long-Term Care		
<b>Project Name/Number:</b>	MassMutual LTC Rate Increase Filing/145MML01-10.05		

## General Information

Project Name: MassMutual LTC Rate Increase Filing

Project Number: 145MML01-10.05

Requested Filing Mode: Review & Approval

Explanation for Combination/Other:

Submission Type: New Submission

Overall Rate Impact: 38.7%

Deemer Date:

Submitted By: Jack Bridges

Status of Filing in Domicile: Authorized

Date Approved in Domicile: 02/24/2021

Domicile Status Comments: A rate increase that varied from 8% to 20%, and averaged 16%, was placed on file in Massachusetts on February 24, 2021.

Market Type: Individual

Individual Market Type:

Filing Status Changed: 10/14/2022

State Status Changed: 10/14/2022

Created By: Blake Wacholz

Corresponding Filing Tracking Number:

State TOI: LTC03I Individual Long Term Care

Filing Description:

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<b>State:</b>	Pennsylvania	<b>Filing Company:</b>	Massachusetts Mutual Life Insurance Company
<b>TOI/Sub-TOI:</b>	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
<b>Product Name:</b>	Long-Term Care		
<b>Project Name/Number:</b>	MassMutual LTC Rate Increase Filing/145MML01-10.05		

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On behalf of Massachusetts Mutual Life Insurance Company (MassMutual), we are submitting the referenced rate filing for your review. These are existing tax-qualified policy forms that provide long-term care coverage. These policy forms were written by MassMutual and issued in Pennsylvania between July 19, 2000 and April 7, 2013. The forms are no longer being marketed in any jurisdiction.

The company is requesting a premium rate increase on these forms, including all associated riders. These forms are in need of a premium rate increase due to emerging and projected experience running more adversely than originally expected.

This rate increase request is a follow up to a 2018 nationwide request to achieve a rate level consistent with that on the company's 513 Series product, which was capped at a maximum increase of 100%, except where required due to regulatory requirements. In jurisdictions that did not approve the initial increase as requested, the company is requesting a follow-up increase to target a lifetime loss ratio that is actuarially equivalent to the 2018 request, as described in the enclosed actuarial memorandum.

This request, however, no longer limits rates to the 513 Series rate level as the company is no longer issuing new business nationwide. As such, the company is requesting an increase that is actuarially equivalent to the original request, but results in revised cumulative rate levels by series, as described below.

For the 200-500 Series, the cumulative rate level requested in this filing was determined by rate series and inflation protection option with consideration for the prior rate increase history in this jurisdiction while ensuring that no policies will receive a rate decrease. For the 511 Series, a uniform rate increase is being requested for all policies. The rate increase was determined in this manner to retain the material variance of that previously requested by including the 513 Series rate cap. The resulting cumulative rate levels being requested as part of this filing are shown in the table in the cover letter.

The table in the cover letter provides the average prior approved increase, the requested increase, and resulting cumulative premium rate increase for each series.

As shown in the table in the cover letter, one prior rate increase has been implemented on these policy forms. In December 2018, the Department allowed the company to implement a maximum 52.1% increase with rates capped at the 513 Series rates on a seriatim basis. Rate increases greater than 15.0% were spread over a period of two to three years. This resulted in a prior rate increase that ranged from 0.0% to 52.1% and averaged 47.3%.

To the extent that policies were previously capped at the 513 Series rates, the rate increase requested in this filing may vary by rate series and all available options and riders. The table in the cover letter provides the distribution, range, and average requested rate increase in Pennsylvania by rate series.

While this current rate increase request is being sought to help alleviate the adverse performance on this business, larger rate increases than requested are needed. As such, filing this rate increase as requested will not constitute a rate guarantee, as the company reserves the right to request additional increases in the future. If it is the Department's position to only allow future additional premium rate increases if experience deteriorates from the current assumptions in this filing, then the company will need to amend this filing to request significantly larger premium rate increases at this time.

Similar to the prior increase, the company will offer insureds affected by the premium increase the option of reducing their policy benefits to provide flexibility of choice for those insureds who wish to maintain a premium level reasonably similar to what they were paying prior to the rate increase. Options for reducing benefits include reducing benefit period or maximum daily benefit amount, extending the elimination period, and removing or reducing optional riders. The company will offer a contingent benefit upon lapse to insureds that trigger a substantial rate increase. Additionally, the company will voluntarily offer

**State:** Pennsylvania **Filing Company:** Massachusetts Mutual Life Insurance Company  
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a contingent benefit upon lapse to insureds affected by the rate increase, even if the increase is not considered substantial.

If the requested rate increase is filed for use, a majority of policyowners will be eligible for a contingent benefit upon lapse. To comply with rate stability regulation in this jurisdiction, enclosed with this filing is a plan, subject to the Department's review, which demonstrates that appropriate administration and claims processing procedures are in effect.

## Company and Contact

### Filing Contact Information

Shawn Stender, Senior Associate Actuary shawn.stender@milliman.com  
Milliman, Inc. 952-240-6661 [Phone]  
8500 Normandale Lake Blvd.  
Suite 1850  
Minneapolis, MN 55437

### Filing Company Information

(This filing was made by a third party - millimaninc)

Massachusetts Mutual Life Insurance Company	CoCode: 65935	State of Domicile:
1295 State Street	Group Code: 435	Massachusetts
Springfield, MA 01111	Group Name:	Company Type:
(413) 788-8411 ext. [Phone]	FEIN Number: 04-1590850	Life/Accident/Health
		State ID Number:

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**State:** Pennsylvania **Filing Company:** Massachusetts Mutual Life Insurance Company  
**TOI/Sub-TOI:** LTC03I Individual Long Term Care/LTC03I.001 Qualified  
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## Filing Fees

### State Fees

Fee Required? Yes  
Fee Amount: \$150.00  
Retaliatory? Yes  
Fee Explanation: There is a \$150 filing fee in the state of domicile.  
Per Company: Yes

Company	Amount	Date Processed	Transaction #
Massachusetts Mutual Life Insurance Company	\$150.00	11/30/2021 01:33 PM	217713123
<b>EFT Total</b>	<b>\$150.00</b>		

<b>State:</b>	Pennsylvania	<b>Filing Company:</b>	Massachusetts Mutual Life Insurance Company
<b>TOI/Sub-TOI:</b>	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
<b>Product Name:</b>	Long-Term Care		
<b>Project Name/Number:</b>	MassMutual LTC Rate Increase Filing/145MML01-10.05		

## Correspondence Summary

### Dispositions

Status	Created By	Created On	Date Submitted
Approved	Michael Hibbert	10/14/2022	10/14/2022

## Objection Letters and Response Letters

### Objection Letters

Status	Created By	Created On	Date Submitted
Disapproved	Michael Hibbert	08/16/2022	08/16/2022
Disapproved	Michael Hibbert	04/11/2022	04/11/2022
Disapproved	Michael Hibbert	02/03/2022	02/03/2022
Disapproved	Michael Hibbert	12/27/2021	12/27/2021

### Response Letters

Responded By	Created On	Date Submitted
Cole Miggler	09/13/2022	09/13/2022
Cole Miggler	07/01/2022	07/01/2022
Megan Anderson	06/02/2022	06/02/2022
Cole Miggler	01/21/2022	01/21/2022

### Amendments

Schedule	Schedule Item Name	Created By	Created On	Date Submitted
Supporting Document	Numerical Data in Excel	Alex Moore	12/15/2021	12/15/2021

### Filing Notes

Subject	Note Type	Created By	Created On	Date Submitted
Updated Contact Information	Note To Reviewer	Cole Miggler	02/14/2022	02/15/2022

<b>SERFF Tracking #:</b>	MILL-132937942	<b>State Tracking #:</b>	MILL-132937942	<b>Company Tracking #:</b>	MASSMUTUAL
<b>State:</b>	Pennsylvania	<b>Filing Company:</b>	Massachusetts Mutual Life Insurance Company		
<b>TOI/Sub-TOI:</b>	LTC03I Individual Long Term Care/LTC03I.001 Qualified				
<b>Product Name:</b>	Long-Term Care				
<b>Project Name/Number:</b>	MassMutual LTC Rate Increase Filing/145MML01-10.05				

## Disposition

Disposition Date: 10/14/2022

Effective Date:

Status: Approved

Comment: Oct 14, 2022

John Hebig, Consulting Actuary  
 Milliman, Inc.  
 8500 Normandale Lake Blvd., Suite 1850  
 Minneapolis, MN 55437

RE:Proposed aggregate 35.8% increase on 4,964 policyholders of Mass Mutual forms MM-200-P-PA, MM-201-P-PA, MM-202-P-PA, MM-203-P-PA, MM-200-P-1-PA, MM-201-P-1-PA, MM-202-P-1-PA, MM-203-P-1-PA, MM-400-P-PA, MM-401-P-PA, MM-402-P-PA, MM-403-P-PA, MM-404-P-PA, MM-405-P-PA, MM500-P-PA, MM502-P-PA, MM500-P-1-PA, and MM502-P-1-PA  
 Pennsylvania Insurance Department ID # MILL-132937942

Dear John Hebig:

The Department approves the rates proposed in the seriatim listing submitted on 7/1/2022.

Sincerely,

Michael Hibbert  
 Actuarial Associate  
 Bureau of Life, Accident and Health Insurance

<b>Company Name:</b>	<b>Overall % Indicated Change:</b>	<b>Overall % Rate Impact:</b>	<b>Written Premium Change for this Program:</b>	<b>Number of Policy Holders Affected for this Program:</b>	<b>Written Premium for this Program:</b>	<b>Maximum % Change (where req'd):</b>	<b>Minimum % Change (where req'd):</b>
Massachusetts Mutual Life Insurance Company	38.700%	38.700%	\$5,103,201	4,964	\$13,179,763	95.300%	3.200%

<b>State:</b>	Pennsylvania	<b>Filing Company:</b>	Massachusetts Mutual Life Insurance Company
<b>TOI/Sub-TOI:</b>	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
<b>Product Name:</b>	Long-Term Care		
<b>Project Name/Number:</b>	MassMutual LTC Rate Increase Filing/145MML01-10.05		

Schedule	Schedule Item	Schedule Item Status	Public Access
Rate (revised)	Rate Tables		Yes
Rate	Rate Tables		No
Supporting Document	Transmittal Letter (A&H)		Yes
Supporting Document	Actuarial Certification (A&H)		Yes
Supporting Document	Actuarial Memorandum and Explanatory Information (A&H)		Yes
Supporting Document	Advertisements (A&H)		Yes
Supporting Document	Authorization to File (A&H)		Yes
Supporting Document	Insert Page Explanation (A&H)		Yes
Supporting Document	Rate Table (A&H)		Yes
Supporting Document	Replacement Form with Highlighted Changes (A&H)		Yes
Supporting Document	Advertisement Compliance Certification		Yes
Supporting Document	Reserve Calculation (A&H)		Yes
Supporting Document	Variability Explanation (A&H)		Yes
Supporting Document (revised)	Numerical Data in Excel		Yes
Supporting Document	Numerical Data in Excel		No
Supporting Document	Sample Policyowner Notification Letter		Yes
Supporting Document	Rate Tables in Excel		Yes
Supporting Document	Claims and Administration Processing Plan		Yes
Supporting Document	Response to December 27, 2021 Objection		Yes
Supporting Document	Response to April 11, 2022 Objection		Yes
Supporting Document	Response to August 16, 2022 Objection		Yes



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**State:** Pennsylvania **Filing Company:** Massachusetts Mutual Life Insurance Company  
**TOI/Sub-TOI:** LTC03I Individual Long Term Care/LTC03I.001 Qualified  
**Product Name:** Long-Term Care  
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## Objection Letter

Objection Letter Status	Disapproved
Objection Letter Date	08/16/2022
Submitted Date	08/16/2022
Respond By Date	

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Dear Shawn Stender,

**Introduction:**

Aug 16, 2022

John Hebig, Consulting Actuary  
Milliman, Inc.  
8500 Normandale Lake Blvd., Suite 1850  
Minneapolis, MN 55437

RE:Proposed aggregate 35.8% increase on 4,964 policyholders of Mass Mutual forms MM-200-P-PA, MM-201-P-PA, MM-202-P-PA, MM-203-P-PA, MM-200-P-1-PA, MM-201-P-1-PA, MM-202-P-1-PA, MM-203-P-1-PA, MM-400-P-PA, MM-401-P-PA, MM-402-P-PA, MM-403-P-PA, MM-404-P-PA, MM-405-P-PA, MM500-P-PA, MM502-P-PA, MM500-P-1-PA, and MM502-P-1-PA  
Pennsylvania Insurance Department ID # MILL-132937942

Dear John Hebig:

The captioned filing has been reviewed by the Pennsylvania Insurance Department. It has been determined that the filing fails to meet the requirements of our Insurance Company Laws or regulations and is therefore disapproved pursuant to the authority granted under Section 304(a) of Act 134, the Accident and Health Filing Reform Act. In the event you have any questions regarding the stated concerns, please feel free to contact the Department for further clarification.

The disapproved filing may be resubmitted within 120 days of the date of disapproval. If the Department does not hear from you within 120 days, the subject filing will be permanently closed. Such filings resubmitted after 120 days must be submitted as a new filing, inclusive of appropriate filing fees and disclosure of the closed filing SERFF tracking number.

We shared Missy Gordon's 7/1/2022 counter-proposal with Department Management and they had some clarifying questions.

On Page 2 of the counter-proposal letter, it states that Mass Mutual's third party administrator would have material difficulty implementing the phased-in increase suggested by the Department while keeping all annual increases no greater than 30%.

What is the nature of the difficulty? Is it contractual, a systems limitation, or something else? Please elaborate.

Sincerely,

Michael Hibbert  
Actuarial Associate  
Bureau of Life, Accident and Health Insurance

**Conclusion:**

Sincerely,  
Michael Hibbert

**State:** Pennsylvania  
**TOI/Sub-TOI:** LTC03I Individual Long Term Care/LTC03I.001 Qualified  
**Product Name:** Long-Term Care  
**Project Name/Number:** MassMutual LTC Rate Increase Filing/145MML01-10.05  
**Filing Company:** Massachusetts Mutual Life Insurance Company

## Objection Letter

Objection Letter Status Disapproved  
Objection Letter Date 04/11/2022  
Submitted Date 04/11/2022  
Respond By Date

Dear Shawn Stender,

**Introduction:**

April 11, 2022

John Hebig, Consulting Actuary  
Milliman, Inc.  
8500 Normandale Lake Blvd., Suite 1850  
Minneapolis, MN 55437

RE: Proposed aggregate 35.8% increase on 4,964 policyholders of Mass Mutual forms MM-200-P-PA, MM-201-P-PA, MM-202-P-PA, MM-203-P-PA, MM-200-P-1-PA, MM-201-P-1-PA, MM-202-P-1-PA, MM-203-P-1-PA, MM-400-P-PA, MM-401-P-PA, MM-402-P-PA, MM-403-P-PA, MM-404-P-PA, MM-405-P-PA, MM500-P-PA, MM502-P-PA, MM500-P-1-PA, and MM502-P-1-PA  
Pennsylvania Insurance Department ID # MILL-132937942

Dear John Hebig:

The captioned filing has been reviewed by the Pennsylvania Insurance Department. It has been determined that the filing fails to meet the requirements of our Insurance Company Laws or regulations and is therefore disapproved pursuant to the authority granted under Section 304(a) of Act 134, the Accident and Health Filing Reform Act. In the event you have any questions regarding the stated concerns, please feel free to contact the Department for further clarification.

The disapproved filing may be resubmitted within 120 days of the date of disapproval. If the Department does not hear from you within 120 days, the subject filing will be permanently closed. Such filings resubmitted after 120 days must be submitted as a new filing, inclusive of appropriate filing fees and disclosure of the closed filing SERFF tracking number.

The Department's LTC rating methodology has recently changed. Consequently, we are making this revised offer.

The Department cannot approve this filing as submitted but we can offer an increase staged over three years as follows:

- (i) Limit the maximum annual increase on any policyholder to not more than 30%.
- (ii) Limit the total increase on any policyholder over the three year implementation period of the increase to less than 100%.
- (iii) Limit increases so that no policyholder receives a cumulative increase greater than that scheduled in this filing over the three year implementation period.
- (iv) Limit increases so that each successive increase for any given policyholder may be implemented no sooner than one year after the prior increase.
- (v) Mass Mutual must provide the PID with a seriatim listing of the affected policies in this block in Excel. Each record within the worksheet must contain a deidentified unique ID, the policy series (i.e. 200, 400, 500, 511, etc.), form number, issue age, issue date, inflation status indicator, benefit period, and the scheduled increase in each year of the three year implementation period.

If Mass Mutual would like to accept our offer, then please respond with an acceptance letter and the requested Excel workbook.

Sincerely,

**State:** Pennsylvania **Filing Company:** Massachusetts Mutual Life Insurance Company  
**TOI/Sub-TOI:** LTC03I Individual Long Term Care/LTC03I.001 Qualified  
**Product Name:** Long-Term Care  
**Project Name/Number:** MassMutual LTC Rate Increase Filing/145MML01-10.05

Michael Hibbert  
Actuarial Associate  
Bureau of Life, Accident and Health Insurance

**Conclusion:**

Sincerely,  
Michael Hibbert

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<b>State:</b>	Pennsylvania	<b>Filing Company:</b>	Massachusetts Mutual Life Insurance Company
<b>TOI/Sub-TOI:</b>	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
<b>Product Name:</b>	Long-Term Care		
<b>Project Name/Number:</b>	MassMutual LTC Rate Increase Filing/145MML01-10.05		

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## Objection Letter

Objection Letter Status	Disapproved
Objection Letter Date	02/03/2022
Submitted Date	02/03/2022
Respond By Date	

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Dear Shawn Stender,

**Introduction:**

Feb 3, 2022

Shawn Stender, Senior Associate Actuary  
Milliman, Inc.  
8500 Normandale Lake Blvd., Suite 1850  
Minneapolis, MN 55437

RE: Proposed aggregate 35.8% increase on 4,964 policyholders of Mass Mutual forms MM-200-P-PA, MM-201-P-PA, MM-202-P-PA, MM-203-P-PA, MM-200-P-1-PA, MM-201-P-1-PA, MM-202-P-1-PA, MM-203-P-1-PA, MM-400-P-PA, MM-401-P-PA, MM-402-P-PA, MM-403-P-PA, MM-404-P-PA, MM-405-P-PA, MM500-P-PA, MM502-P-PA, MM500-P-1-PA, and MM502-P-1-PA  
Pennsylvania Insurance Department ID # MILL-132937942

Dear Shawn Stender:

The captioned filing has been reviewed by the Pennsylvania Insurance Department. It has been determined that the filing fails to meet the requirements of our Insurance Company Laws or regulations and is therefore disapproved pursuant to the authority granted under Section 304(a) of Act 134, the Accident and Health Filing Reform Act. In the event you have any questions regarding the stated concerns, please feel free to contact the Department for further clarification.

The disapproved filing may be resubmitted within 120 days of the date of disapproval. If the Department does not hear from you within 120 days, the subject filing will be permanently closed. Such filings resubmitted after 120 days must be submitted as a new filing, inclusive of appropriate filing fees and disclosure of the closed filing SERFF tracking number.

The Department cannot approve this filing as submitted but we can offer a capped 20% increase on the above captioned forms. In other words, policyholders that were scheduled to receive increases from 0% to 20% can receive their full increase but those scheduled to receive increases greater than 20% are limited to a maximum increase of 20%.

If Mass Mutual would like to accept our capped 20% offer, then please respond with an acceptance letter.

Sincerely,

Michael Hibbert  
Actuary  
Bureau of Life, Accident and Health Insurance

**Conclusion:**

Sincerely,  
Michael Hibbert

**State:** Pennsylvania  
**TOI/Sub-TOI:** LTC03I Individual Long Term Care/LTC03I.001 Qualified  
**Product Name:** Long-Term Care  
**Project Name/Number:** MassMutual LTC Rate Increase Filing/145MML01-10.05  
**Filing Company:** Massachusetts Mutual Life Insurance Company

## Objection Letter

Objection Letter Status Disapproved  
Objection Letter Date 12/27/2021  
Submitted Date 12/27/2021  
Respond By Date

Dear Shawn Stender,

**Introduction:**

Dec 27, 2021

Shawn Stender, Senior Associate Actuary  
Milliman, Inc.  
8500 Normandale Lake Blvd., Suite 1850  
Minneapolis, MN 55437

RE: Proposed aggregate 35.8% increase on 4,964 policyholders of Mass Mutual forms MM-200-P-PA, MM-201-P-PA, MM-202-P-PA, MM-203-P-PA, MM-200-P-1-PA, MM-201-P-1-PA, MM-202-P-1-PA, MM-203-P-1-PA, MM-400-P-PA, MM-401-P-PA, MM-402-P-PA, MM-403-P-PA, MM-404-P-PA, MM-405-P-PA, MM500-P-PA, MM502-P-PA, MM500-P-1-PA, and MM502-P-1-PA  
Pennsylvania Insurance Department ID # MILL-132937942

Dear Shawn Stender:

The captioned filing has been reviewed by the Pennsylvania Insurance Department. It has been determined that the filing fails to meet the requirements of our Insurance Company Laws or regulations and is therefore disapproved pursuant to the authority granted under Section 304(a) of Act 134, the Accident and Health Filing Reform Act. In the event you have any questions regarding the stated concerns, please feel free to contact the Department for further clarification.

The disapproved filing may be resubmitted within 120 days of the date of disapproval. If the Department does not hear from you within 120 days, the subject filing will be permanently closed. Such filings resubmitted after 120 days must be submitted as a new filing, inclusive of appropriate filing fees and disclosure of the closed filing SERFF tracking number.

Please furnish the following information to the Department.

1. Please provide a table in an Excel spreadsheet (perhaps similar to Exhibit 1-a) which shows the historical and projected nationwide earned premium and incurred claims on a calendar year basis assuming no rate increase is granted. Please restate the historical and projected earned premium so that the business from inception appears to have all been earned at the original rate level. The original rate level is the rate level that would have existed if no increase was ever granted on any policy nationwide.
2. Please provide the cumulative weighted average increase granted to date on this block of policies in force in PA or confirm that it is 47.3%.
3. Please provide the percent of active policyholders remaining on this combined block on a nationwide basis. How many policies were issued nationwide? How many policies remain in force nationwide?
4. Please provide a listing of the approved increases by state. Also include a column showing the cumulative increases approved in each state.

Sincerely,

**State:** Pennsylvania **Filing Company:** Massachusetts Mutual Life Insurance Company  
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Michael Hibbert  
Actuary  
Bureau of Life, Accident and Health Insurance

**Conclusion:**

Sincerely,  
Michael Hibbert

<b>State:</b>	Pennsylvania	<b>Filing Company:</b>	Massachusetts Mutual Life Insurance Company
<b>TOI/Sub-TOI:</b>	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
<b>Product Name:</b>	Long-Term Care		
<b>Project Name/Number:</b>	MassMutual LTC Rate Increase Filing/145MML01-10.05		

## Response Letter

Response Letter Status	Submitted to State
Response Letter Date	09/13/2022
Submitted Date	09/13/2022

Dear Michael Hibbert,

**Introduction:**

On behalf of Missy Gordon, thank you for reviewing this filing.

**Response 1**

**Comments:**

Please see the attached document in response to your August 16 request.

**Changed Items:**

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

### Supporting Document Schedule Item Changes

<b>Satisfied - Item:</b>	Response to August 16, 2022 Objection
<b>Comments:</b>	
<b>Attachment(s):</b>	PA_Response to 20220816 Objection_MML_20220913.pdf

**Conclusion:**

Thank you for working with us to complete this filing. Please let us know if you have any additional questions.

Sincerely,

Megan Anderson

<b>SERFF Tracking #:</b>	MILL-132937942	<b>State Tracking #:</b>	MILL-132937942	<b>Company Tracking #:</b>	MASSMUTUAL
<hr/>					
<b>State:</b>	Pennsylvania			<b>Filing Company:</b>	Massachusetts Mutual Life Insurance Company
<b>TOI/Sub-TOI:</b>	LTC03I Individual Long Term Care/LTC03I.001 Qualified				
<b>Product Name:</b>	Long-Term Care				
<b>Project Name/Number:</b>	MassMutual LTC Rate Increase Filing/145MML01-10.05				

## Response Letter

Response Letter Status	Submitted to State
Response Letter Date	07/01/2022
Submitted Date	07/01/2022

*Dear Michael Hibbert,*

### **Introduction:**

*On behalf of Missy Gordon, thank you for reviewing this filing.*

### **Response 1**

#### **Comments:**

*Please see the attached documents in response to your April 11 requests.*

### **Changed Items:**

*No Form Schedule items changed.*



<b>State:</b>	Pennsylvania	<b>Filing Company:</b>	Massachusetts Mutual Life Insurance Company
<b>TOI/Sub-TOI:</b>	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
<b>Product Name:</b>	Long-Term Care		
<b>Project Name/Number:</b>	MassMutual LTC Rate Increase Filing/145MML01-10.05		

Rate/Rule Schedule Item Changes						
Item No.	Document Name	Affected Form Numbers (Separated with commas)	Rate Action	Rate Action Information	Attachments	Date Submitted
1	Rate Tables	MM-200-P-PA, MM-201-P-PA, MM-202-P-PA, MM-203-P-PA, MM-200-P-1-PA, MM-201-P-1-PA, MM-202-P-1-PA, MM-203-P-1-PA, MM-400-P-PA, MM-401-P-PA, MM-402-P-PA, MM-403-P-PA, MM-404-P-PA, MM-405-P-PA, MM500-P-PA, MM502-P-PA, MM500-P-1-PA, MM502-P-1-PA, et al.	Revised	Previous State Filing Number: MILL-131506880 Percent Rate Change Request: 38.7	PA_Rate Tables_MML_LRRS_2 0220701.pdf,	07/01/2022 By: Megan Anderson
<i>Previous Version</i>						
1	Rate Tables	MM-200-P-PA, MM-201-P-PA, MM-202-P-PA, MM-203-P-PA, MM-200-P-1-PA, MM-201-P-1-PA, MM-202-P-1-PA, MM-203-P-1-PA, MM-400-P-PA, MM-401-P-PA, MM-402-P-PA, MM-403-P-PA, MM-404-P-PA, MM-405-P-PA, MM500-P-PA, MM502-P-PA, MM500-P-1-PA, MM502-P-1-PA, et al.	Revised	Previous State Filing Number: MILL-131506880 Percent Rate Change Request: 35.8	PA_Rate Tables_MML_LRRS_2 0211130.pdf,	11/30/2021 By: Jack Bridges

Supporting Document Schedule Item Changes	
<b>Satisfied - Item:</b>	Response to April 11, 2022 Objection
<b>Comments:</b>	
<b>Attachment(s):</b>	PA_Response to 20220411 Objection_MML_20220701.pdf PA_Seriatim Listing_MML_20220701.xlsx PA_Rate Tables_MML_LRRS_20220701.xlsx

<b>SERFF Tracking #:</b>	MILL-132937942	<b>State Tracking #:</b>	MILL-132937942	<b>Company Tracking #:</b>	MASSMUTUAL
<hr/>					
<b>State:</b>	Pennsylvania			<b>Filing Company:</b>	Massachusetts Mutual Life Insurance Company
<b>TOI/Sub-TOI:</b>	LTC03I Individual Long Term Care/LTC03I.001 Qualified				
<b>Product Name:</b>	Long-Term Care				
<b>Project Name/Number:</b>	MassMutual LTC Rate Increase Filing/145MML01-10.05				

**Conclusion:**

Thank you for working with us to complete this filing. Please let us know if you have any additional questions.

Sincerely,

Megan Anderson

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**State:** Pennsylvania **Filing Company:** Massachusetts Mutual Life Insurance Company  
**TOI/Sub-TOI:** LTC03I Individual Long Term Care/LTC03I.001 Qualified  
**Product Name:** Long-Term Care  
**Project Name/Number:** MassMutual LTC Rate Increase Filing/145MML01-10.05

## Response Letter

Response Letter Status	Submitted to State
Response Letter Date	06/02/2022
Submitted Date	06/02/2022

---

Dear Michael Hibbert,

**Introduction:**

Thank you for reviewing this filing.

**Response 1**

**Comments:**

It is our understanding from the April 11 objection, that a response to this objection no longer required.

**Changed Items:**

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

No Supporting Documents changed.

**Conclusion:**

Thank you for working with us to complete this filing. Please let us know if you have any additional questions.

Sincerely,

Megan Anderson

<b>State:</b>	Pennsylvania	<b>Filing Company:</b>	Massachusetts Mutual Life Insurance Company
<b>TOI/Sub-TOI:</b>	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
<b>Product Name:</b>	Long-Term Care		
<b>Project Name/Number:</b>	MassMutual LTC Rate Increase Filing/145MML01-10.05		

## Response Letter

Response Letter Status	Submitted to State
Response Letter Date	01/21/2022
Submitted Date	01/21/2022

Dear Michael Hibbert,

**Introduction:**

On behalf of Missy Gordon, thank you for reviewing this filing.

**Response 1**

**Comments:**

Please see the attached documents in response to your December 27 requests.

**Changed Items:**

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

### Supporting Document Schedule Item Changes

<b>Satisfied - Item:</b>	Response to December 27, 2021 Objection
<b>Comments:</b>	
<b>Attachment(s):</b>	PA_Response to 20211227 Objection_MML_20220121.pdf PA_Response to 20211227 Objection_MML_Attachments_20220121.xlsb

**Conclusion:**

Thank you for working with us to complete this filing. Please let us know if you have any additional questions.

Sincerely,

Megan Anderson

<b>SERFF Tracking #:</b>	MILL-132937942	<b>State Tracking #:</b>	MILL-132937942	<b>Company Tracking #:</b>	MASSMUTUAL
<b>State:</b>	Pennsylvania	<b>Filing Company:</b>	Massachusetts Mutual Life Insurance Company		
<b>TOI/Sub-TOI:</b>	LTC03I Individual Long Term Care/LTC03I.001 Qualified				
<b>Product Name:</b>	Long-Term Care				
<b>Project Name/Number:</b>	MassMutual LTC Rate Increase Filing/145MML01-10.05				

## Amendment Letter

Submitted Date: 12/15/2021

Comments:

Thank you for reviewing this filing. Please see the attached file in response to Jim Laverty's December 15, 2021 email request regarding this filing. As requested, Exhibit I has been added to the Excel file containing numerical exhibits. Please let us know if you have and additional questions.

Changed Items:

*No Form Schedule Items Changed.*

*No Rate Schedule Items Changed.*

Supporting Document Schedule Item Changes	
<b>Satisfied - Item:</b>	Numerical Data in Excel
<b>Comments:</b>	
<b>Attachment(s):</b>	PA_Numerical Exhibits_20211215.xlsx
<i>Previous Version</i>	
<b>Satisfied - Item:</b>	<i>Numerical Data in Excel</i>
<b>Comments:</b>	
<b>Attachment(s):</b>	<i>PA_Supplement Attachments_20211130.xlxb</i>

**State:** Pennsylvania **Filing Company:** Massachusetts Mutual Life Insurance Company  
**TOI/Sub-TOI:** LTC03I Individual Long Term Care/LTC03I.001 Qualified  
**Product Name:** Long-Term Care  
**Project Name/Number:** MassMutual LTC Rate Increase Filing/145MML01-10.05

## Note To Reviewer

**Created By:**

Cole Miggler on 02/14/2022 03:38 PM

**Last Edited By:**

Michael Hibbert

**Submitted On:**

10/14/2022 03:12 PM

**Subject:**

Updated Contact Information

**Comments:**

Please note that due to a changing in staffing, we would like to update the company contact of this filing to John Hebig. His contact information is provided below. Please let us know if you have any questions.

John Hebig, FSA, MAAA  
Consulting Actuary  
Milliman, Inc.  
8500 Normandale Lake Blvd., Suite 1850  
Minneapolis, MN 55437  
(952) 820-2488  
john.hebig@milliman.com

**State:** Pennsylvania **Filing Company:** Massachusetts Mutual Life Insurance Company  
**TOI/Sub-TOI:** LTC03I Individual Long Term Care/LTC03I.001 Qualified  
**Product Name:** Long-Term Care  
**Project Name/Number:** MassMutual LTC Rate Increase Filing/145MML01-10.05

## Post Submission Update Request Processed On 09/29/2022

Status: Allowed  
Created By: Cole Miggler  
Processed By: Michael Hibbert  
Comments:

### General Information:

Field Name	Requested Change	Prior Value
Overall Rate Impact	38.7	35.8

### Company Rate Information:

Company Name:Massachusetts Mutual Life Insurance Company

Field Name	Requested Change	Prior Value
Overall % Indicated Change	38.700%	35.800%
Overall % Rate Impact	38.700%	35.800%
Written Premium Change for this Program	\$5103201	\$4719924
Maximum %Change (where required)	95.300%	91.000%
Minimum %Change (where required)	3.200%	0.000%

<b>SERFF Tracking #:</b>	MILL-132937942	<b>State Tracking #:</b>	MILL-132937942	<b>Company Tracking #:</b>	MASSMUTUAL
<b>State:</b>	Pennsylvania	<b>Filing Company:</b>	Massachusetts Mutual Life Insurance Company		
<b>TOI/Sub-TOI:</b>	LTC03I Individual Long Term Care/LTC03I.001 Qualified				
<b>Product Name:</b>	Long-Term Care				
<b>Project Name/Number:</b>	MassMutual LTC Rate Increase Filing/145MML01-10.05				

## Rate Information

Rate data applies to filing.

<b>Filing Method:</b>	Review and Approval
<b>Rate Change Type:</b>	Increase
<b>Overall Percentage of Last Rate Revision:</b>	47.600%
<b>Effective Date of Last Rate Revision:</b>	12/18/2018
<b>Filing Method of Last Filing:</b>	Review and Approval
<b>SERFF Tracking Number of Last Filing:</b>	MILL-131506880

## Company Rate Information

<b>Company Name:</b>	<b>Overall % Indicated Change:</b>	<b>Overall % Rate Impact:</b>	<b>Written Premium Change for this Program:</b>	<b>Number of Policy Holders Affected for this Program:</b>	<b>Written Premium for this Program:</b>	<b>Maximum % Change (where req'd):</b>	<b>Minimum % Change (where req'd):</b>
Massachusetts Mutual Life Insurance Company	38.700%	38.700%	\$5,103,201	4,964	\$13,179,763	95.300%	3.200%



<b>State:</b>	Pennsylvania	<b>Filing Company:</b>	Massachusetts Mutual Life Insurance Company
<b>TOI/Sub-TOI:</b>	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
<b>Product Name:</b>	Long-Term Care		
<b>Project Name/Number:</b>	MassMutual LTC Rate Increase Filing/145MML01-10.05		

## Rate/Rule Schedule

Item No.	Schedule Item Status	Document Name	Affected Form Numbers (Separated with commas)	Rate Action	Rate Action Information	Attachments
1		Rate Tables	MM-200-P-PA, MM-201-P-PA, MM-202-P-PA, MM-203-P-PA, MM-200-P-1-PA, MM-201-P-1-PA, MM-202-P-1-PA, MM-203-P-1-PA, MM-400-P-PA, MM-401-P-PA, MM-402-P-PA, MM-403-P-PA, MM-404-P-PA, MM-405-P-PA, MM500-P-PA, MM502-P-PA, MM500-P-1-PA, MM502-P-1-PA, et al.	Revised	Previous State Filing Number: MILL-131506880 Percent Rate Change Request: 38.7	PA_Rate Tables_MML_LRRS_20220701.pdf,

<b>SERFF Tracking #:</b>	MILL-132937942	<b>State Tracking #:</b>	MILL-132937942	<b>Company Tracking #:</b>	MASSMUTUAL
<b>State:</b>	Pennsylvania	<b>Filing Company:</b>	Massachusetts Mutual Life Insurance Company		
<b>TOI/Sub-TOI:</b>	LTC03I Individual Long Term Care/LTC03I.001 Qualified				
<b>Product Name:</b>	Long-Term Care				
<b>Project Name/Number:</b>	MassMutual LTC Rate Increase Filing/145MML01-10.05				

**Attachment PA\_Rate Tables\_MML\_LRRS\_20220701.pdf could not be reproduced here for the following reason: Unknown encryption type R = 6**

<b>State:</b>	Pennsylvania	<b>Filing Company:</b>	Massachusetts Mutual Life Insurance Company
<b>TOI/Sub-TOI:</b>	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
<b>Product Name:</b>	Long-Term Care		
<b>Project Name/Number:</b>	MassMutual LTC Rate Increase Filing/145MML01-10.05		

## Supporting Document Schedules

<b>Satisfied - Item:</b>	Transmittal Letter (A&H)
<b>Comments:</b>	
<b>Attachment(s):</b>	PA_Cover_Letter_MML_LRRS_20211130.pdf
<b>Item Status:</b>	
<b>Status Date:</b>	

<b>Bypassed - Item:</b>	Actuarial Certification (A&H)
<b>Bypass Reason:</b>	Not applicable as this is not a form filing.
<b>Attachment(s):</b>	
<b>Item Status:</b>	
<b>Status Date:</b>	

<b>Satisfied - Item:</b>	Actuarial Memorandum and Explanatory Information (A&H)
<b>Comments:</b>	
<b>Attachment(s):</b>	PA_Act_Memo_MML_LRRS_20211130.pdf PA_Supplement_MML_LRRS_20211130.pdf
<b>Item Status:</b>	
<b>Status Date:</b>	

<b>Bypassed - Item:</b>	Advertisements (A&H)
<b>Bypass Reason:</b>	Not applicable as this is not a form filing.
<b>Attachment(s):</b>	
<b>Item Status:</b>	
<b>Status Date:</b>	

<b>Satisfied - Item:</b>	Authorization to File (A&H)
<b>Comments:</b>	
<b>Attachment(s):</b>	Authorization to File 20210104.pdf
<b>Item Status:</b>	
<b>Status Date:</b>	

<b>Bypassed - Item:</b>	Insert Page Explanation (A&H)
<b>Bypass Reason:</b>	Not applicable as this is not a form filing.
<b>Attachment(s):</b>	
<b>Item Status:</b>	

<b>State:</b>	Pennsylvania	<b>Filing Company:</b>	Massachusetts Mutual Life Insurance Company
<b>TOI/Sub-TOI:</b>	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
<b>Product Name:</b>	Long-Term Care		
<b>Project Name/Number:</b>	MassMutual LTC Rate Increase Filing/145MML01-10.05		

<b>Status Date:</b>	
<b>Bypassed - Item:</b>	Rate Table (A&H)
<b>Bypass Reason:</b>	Rate tables are attached on the Rate/Rule Schedule Tab.
<b>Attachment(s):</b>	
<b>Item Status:</b>	
<b>Status Date:</b>	
<b>Bypassed - Item:</b>	Replacement Form with Highlighted Changes (A&H)
<b>Bypass Reason:</b>	Not applicable as this is not a form filing.
<b>Attachment(s):</b>	
<b>Item Status:</b>	
<b>Status Date:</b>	
<b>Bypassed - Item:</b>	Advertisement Compliance Certification
<b>Bypass Reason:</b>	Not applicable as this is not a form filing.
<b>Attachment(s):</b>	
<b>Item Status:</b>	
<b>Status Date:</b>	
<b>Bypassed - Item:</b>	Reserve Calculation (A&H)
<b>Bypass Reason:</b>	Not applicable as this is not a form filing.
<b>Attachment(s):</b>	
<b>Item Status:</b>	
<b>Status Date:</b>	
<b>Bypassed - Item:</b>	Variability Explanation (A&H)
<b>Bypass Reason:</b>	Not applicable as this is not a form filing.
<b>Attachment(s):</b>	
<b>Item Status:</b>	
<b>Status Date:</b>	
<b>Satisfied - Item:</b>	Numerical Data in Excel
<b>Comments:</b>	
<b>Attachment(s):</b>	PA_Numerical Exhibits_20211215.xlsx
<b>Item Status:</b>	
<b>Status Date:</b>	

<b>State:</b>	Pennsylvania	<b>Filing Company:</b>	Massachusetts Mutual Life Insurance Company
<b>TOI/Sub-TOI:</b>	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
<b>Product Name:</b>	Long-Term Care		
<b>Project Name/Number:</b>	MassMutual LTC Rate Increase Filing/145MML01-10.05		

<b>Satisfied - Item:</b>	Sample Policyowner Notification Letter
<b>Comments:</b>	Please note that in the future slight variations in language may occur that do not materially change the information being provided to the policyowner. It is our understanding that such variations do not need to be filed with the Department.
<b>Attachment(s):</b>	Notification Letter 20190801_generic.pdf
<b>Item Status:</b>	
<b>Status Date:</b>	
<b>Satisfied - Item:</b>	Rate Tables in Excel
<b>Comments:</b>	
<b>Attachment(s):</b>	PA_Rate Tables_MML_LRRS_20211130.xlsb
<b>Item Status:</b>	
<b>Status Date:</b>	
<b>Satisfied - Item:</b>	Claims and Administration Processing Plan
<b>Comments:</b>	
<b>Attachment(s):</b>	Claims Administration Process Documentation MM 20211029.pdf
<b>Item Status:</b>	
<b>Status Date:</b>	
<b>Satisfied - Item:</b>	Response to December 27, 2021 Objection
<b>Comments:</b>	
<b>Attachment(s):</b>	PA_Response to 20211227 Objection_MML_20220121.pdf PA_Response to 20211227 Objection_MML_Attachments_20220121.xlsb
<b>Item Status:</b>	
<b>Status Date:</b>	
<b>Satisfied - Item:</b>	Response to April 11, 2022 Objection
<b>Comments:</b>	
<b>Attachment(s):</b>	PA_Response to 20220411 Objection_MML_20220701.pdf PA_Seriatim Listing_MML_20220701.xlsx PA_Rate Tables_MML_LRRS_20220701.xlsx
<b>Item Status:</b>	
<b>Status Date:</b>	
<b>Satisfied - Item:</b>	Response to August 16, 2022 Objection
<b>Comments:</b>	
<b>Attachment(s):</b>	PA_Response to 20220816 Objection_MML_20220913.pdf
<b>Item Status:</b>	

<b>SERFF Tracking #:</b>	MILL-132937942	<b>State Tracking #:</b>	MILL-132937942	<b>Company Tracking #:</b>	MASSMUTUAL
<b>State:</b>	Pennsylvania	<b>Filing Company:</b>	Massachusetts Mutual Life Insurance Company		
<b>TOI/Sub-TOI:</b>	LTC03I Individual Long Term Care/LTC03I.001 Qualified				
<b>Product Name:</b>	Long-Term Care				
<b>Project Name/Number:</b>	MassMutual LTC Rate Increase Filing/145MML01-10.05				
<b>Status Date:</b>					

State:	Pennsylvania	Filing Company:	Massachusetts Mutual Life Insurance Company
TOI/Sub-TOI:	LTC03I Individual Long Term Care/LTC03I.001 Qualified		
Product Name:	Long-Term Care		
Project Name/Number:	MassMutual LTC Rate Increase Filing/145MML01-10.05		

***Attachment PA\_Numerical Exhibits\_20211215.xlsx is not a PDF document and cannot be reproduced here.***

***Attachment PA\_Rate Tables\_MML\_LRRS\_20211130.xlsb is not a PDF document and cannot be reproduced here.***

***Attachment PA\_Response to 20211227 Objection\_MML\_20220121.pdf could not be reproduced here for the following reason: Unknown encryption type R = 6***

***Attachment PA\_Response to 20211227 Objection\_MML\_Attachments\_20220121.xlsb is not a PDF document and cannot be reproduced here.***

***Attachment PA\_Response to 20220411 Objection\_MML\_20220701.pdf could not be reproduced here for the following reason: Unknown encryption type R = 6***

***Attachment PA\_Seriatim Listing\_MML\_20220701.xlsx is not a PDF document and cannot be reproduced here.***

***Attachment PA\_Rate Tables\_MML\_LRRS\_20220701.xlsx is not a PDF document and cannot be reproduced here.***

***Attachment PA\_Response to 20220816 Objection\_MML\_20220913.pdf could not be reproduced here for the following reason: Unknown encryption type R = 6***



8500 Normandale Lake Blvd.  
Suite 1850  
Minneapolis, MN 55437-3830  
USA

Tel +1 952 897 5300

milliman.com

November 30, 2021

Honorable Jessica Altman  
Insurance Commissioner  
Pennsylvania Insurance Department (Department)

*Via SERFF*

**Re: Massachusetts Mutual Life Insurance Company (MassMutual)  
Company NAIC # 65935  
SERFF Tracking # MILL-132937942**

**200 Series**

Tax-Qualified Comprehensive Long-Term Care Policy Form	MM-200-P-PA et al.
Tax-Qualified Nursing Facility Only Long-Term Care Policy Form	MM-201-P-PA et al.
Tax-Qualified Franchise Comprehensive Long-Term Care Policy Form	MM-202-P-PA et al.
Tax-Qualified Franchise Nursing Facility Only Long-Term Care Policy Form	MM-203-P-PA et al.
Tax-Qualified Comprehensive Long-Term Care Policy Form	MM-200-P-1-PA et al.
Tax-Qualified Nursing Facility Only Long-Term Care Policy Form	MM-201-P-1-PA et al.
Tax-Qualified Franchise Comprehensive Long-Term Care Policy Form	MM-202-P-1-PA et al.
Tax-Qualified Franchise Nursing Facility Only Long-Term Care Policy Form	MM-203-P-1-PA et al.

**400 Series**

Tax-Qualified Comprehensive Long-Term Care Policy Form	MM-400-P-PA et al.
Tax-Qualified Nursing Facility Only Long-Term Care Policy Form	MM-401-P-PA et al.
Tax-Qualified Franchise-Association Discount Comprehensive Long-Term Care Policy Form	MM-402-P-PA et al.
Tax-Qualified Franchise-Association Discount Nursing Facility Only Long-Term Care Policy Form	MM-403-P-PA et al.
Tax-Qualified Franchise-Employer Discount Comprehensive Long-Term Care Policy Form	MM-404-P-PA et al.
Tax-Qualified Franchise-Employer Discount Nursing Facility Only Long-Term Care Policy Form	MM-405-P-PA et al.

**500 Series**

Tax-Qualified Comprehensive Long-Term Care Policy Form	MM500-P-PA et al.
Tax-Qualified Franchise Comprehensive Long-Term Care Policy Form	MM502-P-PA et al.

**511 Series**

Tax-Qualified Comprehensive Long-Term Care Policy Form	MM500-P-1-PA et al.
Tax-Qualified Franchise Comprehensive Long-Term Care Policy Form	MM502-P-1-PA et al.

Dear Commissioner Altman:

On behalf of MassMutual, we are submitting the referenced rate filing for your review. These are existing tax-qualified policy forms that provide long-term care coverage. These policy forms were written by MassMutual and issued in Pennsylvania between July 19, 2000 and April 7, 2013. The forms are no longer being marketed in any jurisdiction.

Offices in Principal Cities Worldwide

This work product was prepared solely to provide assistance to MassMutual. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends recipient be aided by its own actuary or other qualified professional when reviewing the Milliman work product.



The company is requesting a premium rate increase on the above-listed forms, including all associated riders. These forms are in need of a premium rate increase due to emerging and projected experience running more adversely than originally expected.

This rate increase request is a follow up to a 2018 nationwide request to achieve a rate level consistent with that on the company's 513 Series product, which was capped at a maximum increase of 100%, except where required due to regulatory requirements. In jurisdictions that did not approve the initial increase as requested, the company is requesting a follow-up increase to target a lifetime loss ratio that is actuarially equivalent to the 2018 request, as described in the enclosed actuarial memorandum.

This request, however, no longer limits rates to the 513 Series rate level as the company is no longer issuing new business nationwide. As such, the company is requesting an increase that is actuarially equivalent to the original request, but results in revised cumulative rate levels by series, as described below.

For the 200-500 Series, the cumulative rate level requested in this filing was determined by rate series and inflation protection option with consideration for the prior rate increase history in this jurisdiction while ensuring that no policies will receive a rate decrease. For the 511 Series, a uniform rate increase is being requested for all policies. The rate increase was determined in this manner to retain the material variance of that previously requested by including the 513 Series rate cap. The resulting cumulative rate levels being requested as part of this filing are shown in the following table.

**Pennsylvania Proposed Cumulative Rate Increase  
by Series and Inflation Protection Option**

Series	Auto Inflation	No Inflation
200	116.0%	72.0%
400	109.0	72.0
500	91.0	53.0
511	Uniform 10.0% increase requested on current rates <sup>[1]</sup>	

[1] Proposed cumulative rates range between 22.0% to 64.1% based on the current benefit coverage of policies in force in Pennsylvania as of December 31, 2019.

The table below provides the average prior approved increase, the requested increase, and resulting cumulative premium rate increase for each series.

**Pennsylvania Average Rate Increase Summary by Series  
Based on the Distribution of Business as of December 31, 2019<sup>[1]</sup>**

Series	Prior Approved Increase	Requested Increase	Cumulative Increase
200	51.1%	40.6%	112.5%
400	48.6	38.7	106.1
500	44.4	30.8	88.9
511	28.8	10.0 <sup>[2]</sup>	41.7
All Series	47.3	35.8	100.0

[1] Excludes policies assumed to be paid up prior to implementation of the requested rate increase.

[2] A uniform 10.0% increase is being requested on the 511 Series.

As shown in the table above, one prior rate increase has been implemented on the above-referenced policy forms. In December 2018, the Department allowed the company to implement a maximum 52.1% increase with rates capped at the 513 Series rates on a seriatim basis. Rate increases greater than 15.0% were spread over a period of two to three years. This resulted in a prior rate increase that ranged from 0.0% to 52.1% and averaged 47.3%.

To the extent that policies were previously capped at the 513 Series rates, the rate increase requested in this filing may vary by rate series and all available options and riders. The following table provides the distribution, range, and

average requested rate increase in Pennsylvania by rate series. The averages shown in the following table are the same as those shown in the Requested Increase column of the table above.

**Pennsylvania Requested Rate Increase Distribution, Range, and  
Average Increase by Series<sup>[1]</sup>**

Rate Increase	All Series	200	400	500	511
0-10%	5%	0%	0%	3%	100%
11-20%	6	7	7	2	0
21-30%	15	1	1	66	0
31-40%	16	1	79	15	0
41-50%	55	90	3	8	0
51-60%	2	1	5	3	0
61-70%	1	<1	3	2	0
71-80%	<1	0	2	1	0
81-90%	<1	0	<1	<1	0
91-100%	<1	<1	0	<1	0
Minimum	0.0	13.0	13.0	1.0	10.0
Maximum	91.0	91.0	84.0	91.0	10.0
Average	35.8	40.6	38.7	30.8	10.0

[1] As of December 31, 2019 and excludes policies assumed to be paid up prior to implementation of the requested rate increase.

While this current rate increase request is being sought to help alleviate the adverse performance on this business, larger rate increases than requested are needed. As such, filing this rate increase as requested will not constitute a rate guarantee, as the company reserves the right to request additional increases in the future. If it is the Department's position to only allow future additional premium rate increases if experience deteriorates from the current assumptions in this filing, then the company will need to amend this filing to request significantly larger premium rate increases at this time.

Similar to the prior increase, the company will offer insureds affected by the premium increase the option of reducing their policy benefits to provide flexibility of choice for those insureds who wish to maintain a premium level reasonably similar to what they were paying prior to the rate increase. Options for reducing benefits include reducing benefit period or maximum daily benefit amount, extending the elimination period, and removing or reducing optional riders. The company will offer a contingent benefit upon lapse to insureds that trigger a substantial rate increase. Additionally, the company will voluntarily offer a contingent benefit upon lapse to insureds affected by the rate increase, even if the increase is not considered substantial.

If the requested rate increase is filed for use, a majority of policyowners will be eligible for a contingent benefit upon lapse. To comply with rate stability regulation in this jurisdiction, enclosed with this filing is a plan, subject to the Department's review, which demonstrates that appropriate administration and claims processing procedures are in effect.

The following items are included with this submission:

- cover letter
- letter from MassMutual authorizing us to submit this filing on their behalf
- actuarial memorandum
- supplement to the actuarial memorandum
- Claims and Administration Processing plan, as provided by MassMutual
- Microsoft Excel spreadsheet containing numerical data
- current and proposed premium rate schedules
- current and proposed premium rate schedules in Excel
- policyowner notification letter<sup>[1]</sup>

*[1] Please note that in the future slight variations in language may occur that do not materially change the information being provided to the policyowner. It is our understanding that such variations do not need to be filed with the Department.*

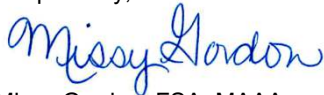
The required retaliatory filing fee of \$150 will be paid via Electronic Funds Transfer (EFT).

The contact person for this filing is:

Shawn Stender, ASA, MAAA  
Senior Associate Actuary  
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Thank you for your assistance in reviewing this filing.

Respectfully,

A handwritten signature in blue ink that reads "Missy Gordon".

Missy Gordon, FSA, MAAA  
Principal and Consulting Actuary

MAG/bw

Enclosures

**MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY**

**Address:** 1295 State Street, Springfield, MA 01111

**Actuarial Memorandum**

**November 30, 2021**

<u>Product</u>	<u>Number</u>
200 Series	
Tax-Qualified Comprehensive Long-Term Care Policy Form	MM-200-P-PA et al.
Tax-Qualified Nursing Facility Only Long-Term Care Policy Form	MM-201-P-PA et al.
Tax-Qualified Franchise Comprehensive Long-Term Care Policy Form	MM-202-P-PA et al.
Tax-Qualified Franchise Nursing Facility Only Long-Term Care Policy Form	MM-203-P-PA et al.
Tax-Qualified Comprehensive Long-Term Care Policy Form	MM-200-P-1-PA et al.
Tax-Qualified Nursing Facility Only Long-Term Care Policy Form	MM-201-P-1-PA et al.
Tax-Qualified Franchise Comprehensive Long-Term Care Policy Form	MM-202-P-1-PA et al.
Tax-Qualified Franchise Nursing Facility Only Long-Term Care Policy Form	MM-203-P-1-PA et al.
400 Series	
Tax-Qualified Comprehensive Long-Term Care Policy Form	MM-400-P-PA et al.
Tax-Qualified Nursing Facility Only Long-Term Care Policy Form	MM-401-P-PA et al.
Tax-Qualified Franchise-Association Discount Comprehensive Long-Term Care Policy Form	MM-402-P-PA et al.
Tax-Qualified Franchise-Association Discount Nursing Facility Only Long-Term Care Policy Form	MM-403-P-PA et al.
Tax-Qualified Franchise-Employer Discount Comprehensive Long-Term Care Policy Form	MM-404-P-PA et al.
Tax-Qualified Franchise-Employer Discount Nursing Facility Only Long-Term Care Policy Form	MM-405-P-PA et al.
500 Series	
Tax-Qualified Comprehensive Long-Term Care Policy Form	MM500-P-PA et al.
Tax-Qualified Franchise Comprehensive Long-Term Care Policy Form	MM502-P-PA et al.
511 Series	
Tax-Qualified Comprehensive Long-Term Care Policy Form	MM500-P-1-PA et al.
Tax-Qualified Franchise Comprehensive Long-Term Care Policy Form	MM502-P-1-PA et al.

Massachusetts Mutual Life Insurance Company (MassMutual) is requesting a rate increase on the above listed long-term care policy forms. The company issued these policy forms in Pennsylvania between July 19, 2000 and April 7, 2013.

Nationwide, the company is requesting an actuarially equivalent rate increase level, except where required due to regulatory requirements. Unless otherwise specified, the nationwide request captures all MassMutual long-term care products from the following five rate series that are no longer being marketed in any jurisdiction: 200, 300, 400, 500, and 511. This actuarial memorandum captures the pooled experience of the above-listed policy forms and similar policy forms issued nationwide across the five rate series.

In Pennsylvania, the company is requesting a rate increase that averages 35.8%. This rate increase is consistent with the nationwide request as described below in Section 2.

**1. Purpose of Filing**

This actuarial memorandum has been prepared for the purpose of demonstrating that the requested rate increase meets the minimum requirements of the 2014 National Association of Insurance Commissioners (NAIC) Long-Term Care Insurance Model Regulation (Model Regulation). The enclosed supplement to the actuarial memorandum demonstrates compliance with the applicable regulatory requirements of this jurisdiction to the extent they differ from the Model Regulation, and includes other commonly requested information of this jurisdiction. It may not be suitable for other purposes.

**2. Requested Rate Increase**

This rate increase request is a follow up to a 2018 nationwide request to achieve a rate level consistent with that on the company's 513 Series product, which was capped at a maximum increase of 100%, except where required due to regulatory requirements. In jurisdictions that did not approve the initial increase as requested, the company is requesting a follow-up increase to target a lifetime loss ratio

**MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY**

**Address:** 1295 State Street, Springfield, MA 01111

**Actuarial Memorandum**

**November 30, 2021**

actuarially equivalent to the 2018 request. The company is seeking this rate increase request to help alleviate the adverse performance on this business.

This request, however, no longer limits rates to the 513 Series rate level as the company is no longer issuing new business nationwide. As such, the company is requesting an increase that is actuarially equivalent to the original request, but results in revised cumulative rate levels by series, as described below.

The cumulative rate level reflected in the experience exhibits in this filing was determined by rate series and inflation protection option with consideration for the prior rate increase history on a nationwide basis. The resulting cumulative rate levels based on this nationwide experience are shown in the following table. The enclosed cover letter provides similar information based on the jurisdiction-specific distribution.

**Nationwide Proposed Cumulative Rate Increase<sup>[1]</sup>  
by Series and Inflation Protection Option**

Series	Auto Inflation	No Inflation	Average <sup>[2]</sup>
200	116.0%	72.0%	113.2%
300	116.0	72.0	114.6
400	109.0	72.0	107.8
500	91.0	40.0	87.0
511	46.0	17.0	42.0
Average <sup>[2]</sup>	99.0	64.4	95.8

[1] This table does not reflect certain jurisdiction-specific cases where (i) the actual cumulative rate level may be higher than that shown in this table to ensure no rate decreases occur for certain policies and (ii) a uniform increase is being requested for all policies within a rate series where all policies were previously capped at the 513 Series rates. Both of these cases were considered in the development of the increase to ensure the resulting rate level is actuarially equivalent to the 2018 request.

[2] Reflects the average rate increase based on the current benefit coverage and distribution of business as of December 31, 2019 and excludes policies assumed to be paid-up prior to the requested rate increase implementation date.

The rate increase was determined in this manner to retain the material variance of that previously requested by including the 513 Series rate cap and to target an actuarially equivalent lifetime loss ratio. Based on the nationwide rate increases approved through May 2021, which average 45.3%, an additional increase averaging 34.7% is needed in order to produce a lifetime loss ratio of 123%. This 123% lifetime loss ratio is equivalent to the 119% lifetime loss ratio reflected in Exhibit I-b of the 2018 filing but reflects a revision to the reduced benefit option election modeling. This approach does not recoup any increase for the revision to the modeling methodology.

The table below provides the average prior approved increase, the current requested increase, and resulting cumulative rate increase based on the nationwide increase request for each series. The enclosed cover letter provides similar information based on the experience for this jurisdiction.

**MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY**

**Address:** 1295 State Street, Springfield, MA 01111

**Actuarial Memorandum**

**November 30, 2021**

**Nationwide Average Rate Increase Summary by Series<sup>[1]</sup>**

Series	Prior Approved Increase <sup>[2]</sup>	Requested Increase	Cumulative Increase
200	50.6%	41.6%	113.2%
300	57.8	36.0	114.6
400	52.8	36.0	107.8
500	41.1	32.5	87.0
511	16.9	21.5	42.0
All Series	45.3	34.7	95.8

[1] Reflects the average rate increase based on the current benefit coverage and distribution of business as of December 31, 2019 and excludes policies assumed to be paid-up prior to the requested rate increase implementation date.

[2] Reflects rate increases approved through May 2021.

To the extent that policies were previously capped at the 513 Series rates, the rate increase requested in this filing may vary by rate series and all available options and riders. The table below provides the distribution, range, and average requested rate increase for each series based on the nationwide distribution of business. The averages shown in the following table are the same as those shown in the Requested Increase column of the table above. The enclosed cover letter provides similar information based on the jurisdiction-specific distribution and describes the requested rate increase in this jurisdiction.

**Nationwide Rate Increase Request Distribution, Range, and Average Increase by Series<sup>[1]</sup>**

Rate Increase	All	200	300	400	500	511
0-10%	33%	28%	39%	32%	29%	38%
11-20%	5	3	2	4	4	18
21-30%	8	3	3	8	19	4
31-40%	11	10	13	14	12	6
41-50%	16	24	14	11	5	34
51-60%	4	3	3	2	8	0
61-70%	2	2	2	3	4	<1
71-80%	3	4	5	3	<1	0
81-90%	3	2	3	3	8	0
91-100%	4	<1	<1	6	11	0
101-110%	5	4	7	14	0	0
111-120%	6	17	9	0	0	0
Minimum	0.0	0.0	0.0	0.0	0.0	0.0
Maximum	116.0	116.0	116.0	109.0	100.0	61.0
Average	34.7	41.6	36.0	36.0	32.5	21.5

[1] Reflects the current benefit coverage as of December 31, 2019 and excludes policies assumed to be paid-up prior to the requested rate increase implementation date.

While this current rate increase request is being sought to help alleviate the adverse performance on this business, larger rate increases than requested are needed. As such, filing this rate increase as requested will not constitute a rate guarantee, as the company reserves the right to request additional increases in the future. If it is the department's position to only allow future additional premium rate increases if experience deteriorates from the current assumptions in this filing, then the company will need to amend this filing to request significantly larger premium rate increases at this time.

As the previous rate increase was capped by the 513 Series rates on a seriatim level, multiple rate tables may be needed to calculate the current and proposed rates for a given policyowner. The Instructions page of the rate tables provides more specifics to show how the rates are calculated.

Corresponding rate tables reflecting the current and proposed rate schedules for policy forms affected by this rate increase are enclosed with this filing. Please note that an Excel version of the rate tables is also enclosed. This Excel version represents the rate basis the administrator will use in implementing this rate increase and is provided for illustrative purposes. The actual rates implemented may vary from those in the enclosed rate tables due to implementation rounding algorithms.

**MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY**

**Address:** 1295 State Street, Springfield, MA 01111

**Actuarial Memorandum**

**November 30, 2021**

As the company is not currently marketing new business, the required statement that the renewal premium rate schedules are not greater than the new business premium rate schedules is not applicable.

**3. Description of Benefits**

The 200, 300, 400, 500, and 511 Series are existing tax-qualified policy forms that provide long-term care coverage. They are individually and jointly underwritten and provide comprehensive and facility only coverage on a reimbursement basis. Certain policy forms also included a rider to convert to coverage on an indemnity basis. These rate series have benefit eligibility requirements that involve activities of daily living (ADL) deficiencies or cognitive impairment. Waiver of premium is provided when certain benefits are being paid.

A daily benefit amount, benefit period, and elimination period were selected at issue. The available choices for benefit period and elimination period varied by rate series and are shown in Section 21 below.

At issue, the policyowner may have had the option to choose one of the following inflation options, the availability of which varied by rate series as shown in Section 21 below: no inflation, simple 5% inflation, compound 3% inflation, or compound 5% inflation. The simple inflation option provides for benefit levels that increase on each anniversary date by 5% of the daily benefit amount chosen at issue for the life of the insured. The compound inflation option provides for benefit levels that increase on each anniversary date by 3% or 5% compounded annually for the life of the insured. These automatic increasing benefits apply even when the insured is in claim status.

Premiums are paid for the life of the policy, unless the policyowner elected at issue a limited premium payment period, which varies by rate series as shown in Section 21. An additional option was available for all premium payment periods in which the policyowner could pay a higher first year premium followed by discounted (reduced) renewal premium thereafter (a.k.a., discounted renewal).

At issue, the policyowner may have been offered the option of selecting riders (e.g., return of premium, shared care) that provide the types of coverage, which vary by rate series, as shown in the enclosed rate tables.

The 200, 300, and 400 Series (a.k.a., pre-500 business) offered joint coverage policies. Joint coverage provides equal coverage for two persons if both apply and are issued coverage under the policy. When one of the joint lives dies or exhausts their benefits or terminates, coverage continues for the remaining insured. The new premium rate will be the premium that would have been charged for an individual policy at the original issue age and risk class of the remaining insured.

The 500 and 511 Series (a.k.a., 500+ business) are participating policy forms. Explicit dividend margin was incorporated into the pricing for the 500+ business that was to be released to policyowners if experience emerged as originally expected in pricing. However, emerging experience is worse than that expected with the dividend margin such that no dividends have been or are expected to be paid on these policy forms.

Most jurisdictions included Partnership-eligible policy forms or options for each rate series, subject to the individual Partnership requirements of each jurisdiction. Most jurisdictions issued the 200 Series under one policy form, but issued two sets of rates based on issue date. The first set of rates was originally priced in 2000 and the second was subsequently repriced in 2001, where the issue date range of each set is jurisdiction-specific.

A contingent benefit upon lapse (CBUL) will be available to all policyowners at the time of the rate increase.

**MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY**

**Address:** 1295 State Street, Springfield, MA 01111

**Actuarial Memorandum**

**November 30, 2021**

**4. Renewability**

These policies are guaranteed renewable for life.

**5. Applicability**

This rate increase applies to all policies issued on these policy forms in this jurisdiction. The rate changes will apply to the premium of the base policy form and all associated options and riders.

**6. Actuarial Assumptions**

The following assumptions are used to project the experience shown in this filing.

- a. Morbidity reflects claim costs developed using the 2014 Milliman *Long-Term Care Guidelines (Guidelines)* with adjustments for underwriting selection and an all-lives exposure basis. The claim costs were further adjusted based on historical claim experience by rate series, attained age, policy duration, benefit period, benefit payment type, gender, and underwriting class, to the extent credible. These adjustment factors can be found in Exhibit A-3a of Appendix A to this memorandum.
- b. Mortality Rates reflect the 2012 Individual Annuity Mortality Basic gender-distinct table (2012IAM). The mortality rates were adjusted based on historical experience by attained age, policy duration, gender, underwriting class, and partner status, to the extent credible. These adjustment factors can be found in Exhibit A-1a of Appendix A to this memorandum.
- c. Voluntary Lapse Rates vary by policy duration and partner status. The following table provides lapse rates for lifetime-payment policies.

Duration	Single	Partnered
1	4.00%	1.50%
2	5.50	2.50
3	3.50	2.00
4	3.00	1.50
5	2.50	1.20
6	2.00	0.90
7	1.75	0.70
8	1.25	0.60
9+	0.90	0.50

The lapse rates in the above table were adjusted based on the following criteria for the additional premium payment options:

- For the ten-pay option, a reduction of 50% of the above lapse rates is assumed for durations one through eight, and 0% lapse thereafter.
  - For the twenty-pay option, a reduction of 25% of the above lapse rates is assumed for durations one through fifteen, and 0% lapse thereafter.
  - For the paid-up at age 65 option, a reduction of 25% of the above lapse rates is assumed for all durations with issue ages 60 and lower, and 0% lapse for all durations with issue ages greater than 60.
  - For the discounted renewal option, a reduction of 25% of the above lapse rates is assumed for all durations.
- d. Benefit Expiry Rates reflect assumed policy termination due to exhaustion of benefits on limited benefit period policies. The rates are based on the *Guidelines* and vary by gender, benefit period, and attained age as shown in the following table.



# MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY

Address: 1295 State Street, Springfield, MA 01111

## Actuarial Memorandum

November 30, 2021

Gender	Benefit Period in Years	Attained Age*										
		<65	65	70	75	80	85	90	95	100	105	110+
Female	2	0.0%	0.0%	0.1%	0.2%	0.4%	1.2%	3.1%	6.1%	9.1%	14.6%	20.0%
	3	0.0	0.0	0.1	0.1	0.3	0.8	2.2	4.7	7.5	14.1	20.0
	4	0.0	0.0	0.0	0.1	0.2	0.6	1.5	3.3	5.7	12.4	20.0
	5	0.0	0.0	0.0	0.1	0.1	0.4	1.1	2.4	4.5	10.1	20.0
	6	0.0	0.0	0.0	0.0	0.1	0.3	0.9	2.1	3.9	7.7	20.0
	10	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.9	1.9	20.0
	Lifetime	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Male	2	0.0	0.0	0.1	0.1	0.3	0.7	1.8	3.3	4.7	7.4	20.0
	3	0.0	0.0	0.0	0.1	0.2	0.4	1.1	2.2	3.5	6.5	20.0
	4	0.0	0.0	0.0	0.0	0.1	0.3	0.7	1.5	2.5	5.4	20.0
	5	0.0	0.0	0.0	0.0	0.1	0.2	0.5	1.1	2.0	4.5	20.0
	6	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.9	1.9	3.6	20.0
	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.9	20.0
	Lifetime	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

\* The assumption varies by attained age, but is shown every five years for display purposes.

- e. Insured Behavior Due to the Rate Increase. At the time of a rate increase, insureds have the option to elect a CBUL or reduced benefit options (RBO). An increase in morbidity for adverse selection due to the rate increase based on the percentage of insureds that elect CBUL and RBO is assumed.

Insureds who elect a CBUL are modeled as a lapse (i.e., the CBUL benefit is not modeled), which results in a slightly lower lifetime loss ratio than if the CBUL benefit had been modeled.

CBUL and RBO election are functions of cumulative rate increase magnitude. Adverse selection associated with the requested increase is a function of CBUL and RBO election. The following provides approximate averages for these assumptions based on the nationwide distribution for all rate series combined: 7% CBUL election rate, 18% RBO election rate, and 4% morbidity increase due to adverse selection. These values are based on the cumulative requested increase described in Section 2. The assumption is applied on a seriatim basis and prorated for the requested increase needed to achieve the cumulative rate increase described in Section 2.

- f. Interest Rate consistent with the maximum valuation interest rate applicable to the year of issue (ranges from 3.5% to 4.5% and averages 4.1%) is used to demonstrate compliance with the minimum loss ratio requirements.
- g. Annual Improvement is assumed for 10 future years in the mortality and morbidity assumptions. Annual improvement factors vary by attained age based on the G2 improvement scale from the 2012IAM table.
- h. Expenses have not been explicitly projected. Originally filed expense assumptions are assumed to remain appropriate, except that commissions are not paid on the increased premium.
- i. Dividends are not projected in the current experience as the company has not historically paid a dividend and does not anticipate paying a dividend in the future on its long-term care business for the 500+ business.

The above assumptions are based on the experience of policies issued by MassMutual, industry experience, and actuarial judgment. These assumptions are based on the nationwide experience of all long-term care business issued by MassMutual at the time of development, which includes the 200, 300, 400, 500, 511, and 513 Series. In developing the persistency assumptions, policy termination experience through 2016 was used. For the morbidity assumption, claim experience through 2016 with claim runout through 2017 was used. Consideration was given to whether adjustments were needed to

# MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY

Address: 1295 State Street, Springfield, MA 01111

## Actuarial Memorandum

November 30, 2021

the current morbidity and persistency assumptions given the additional years of experience that have become available in the time since the assumptions were developed. The above assumptions are deemed reasonable for the particular policy forms in this filing and are considered "most likely" (without explicit margin) based on the experience used to develop the assumptions.

In establishing the assumptions described in this section, the policy design, underwriting, and claims adjudication practices for the above-referenced policy forms were taken into consideration. Appendix A to this memorandum provides a description of the development of and justification for the assumptions used in this filing.

The company is not currently marketing long-term care products. As a result, the requirement to reflect on any assumptions that deviate from those used for pricing other forms currently available for sale is not applicable.

### 7. Marketing Method

These policy forms were marketed by agents of MassMutual and/or by independent brokers.

### 8. Underwriting Description

These policies were individually underwritten with the use of various underwriting tools in addition to the application, which may have included medical records, paramedical functional assessments, cognitive screenings, face-to-face interviews, and/or attending physician statements.

### 9. Premiums

Premiums are unisex and payable for life unless the insured selected a limited premium payment period option. The premiums may vary by policy form, issue age, elimination period, benefit period, initial daily benefit amount, inflation option, premium payment option, underwriting class, joint status, discounts (e.g., partner status at issue), home care coverage, and the selection of any riders.

### 10. Issue Age Range

Issue ages are from 18 to 84.

### 11. Area Factors

Area factors are not used for these products.

### 12. Premium Modalization Rules

The following modal factors and percent distributions (based on the nationwide in-force insured count as of December 31, 2019) are applied to the annual premium (AP):

Premium Mode	Modal Factors	Percent Distribution
Annual	1.000*AP	45%
Semi-Annual	0.520*AP	4
Quarterly <sup>[1]</sup>	0.265*AP	9
Monthly <sup>[1]</sup>	0.088*AP	42

[1] Factor may vary based on policy form and payment option.

### 13. Reserves

Active life reserves and reserves for the election of a CBUL have not been used in the experience exhibits for this rate increase analysis, except as described in the supplement to the actuarial

**MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY**

**Address:** 1295 State Street, Springfield, MA 01111

**Actuarial Memorandum**

**November 30, 2021**

memorandum. Claim reserves as of December 31, 2020 have been discounted to the incurral date of each respective claim and included in historical incurred claims. Incurred but not reported (IBNR) reserves have not been used as the incurred claims include paid claim runout through 2020.

**14. Trend Assumptions**

As this is not medical insurance, an explicit medical cost trend is not included in the projections.

**15. Demonstration of Satisfaction of Loss Ratio Requirements**

This filing uses nationwide experience of all policies of the 200, 300, 400, 500, and 511 Series. The nationwide experience used in this filing includes experience on MassMutual long-term care products from the above-listed rate series. These products are no longer being marketed in any jurisdiction. Pooling these forms' experience is appropriate as the policy forms have similar benefits, it is consistent with how MassMutual manages the business, and combining experience increases credibility.

Exhibit I provides actual and projected experience using current assumptions. Actual experience is provided from inception through 2019 (with claim runout through 2020) and then projected on a seriatim basis for 60 years using the current assumptions described above in Section 6. The actual and projected experience is based on nationwide premiums reflecting rate increases approved through May 2021. The after increase projected experience reflects the requested increase by series (shown in Section 2) on a seriatim basis.

Values in Exhibit I are shown (a) before and (b) after the requested rate increase. Included are calendar year earned premiums, incurred claims, end of year lives, and annual loss ratios. As shown in Exhibit I, the anticipated lifetime loss ratio with the requested rate increase exceeds the minimum loss ratio required by pre-rate stability regulation.

The following table demonstrates that the lifetime loss ratios by series also exceed the minimum loss ratio required by pre-rate stability regulation. The 'All' row corresponds to that shown in Exhibit I.

**Lifetime Loss Ratios<sup>[1]</sup> at the Maximum Valuation Interest Rate by Series**

Series	Before Increase	After Increase
All	141%	123%
200	171	150
300	172	152
400	134	116
500	103	90
511	88	79

[1] Reflects rate increases approved through May 2021.

Exhibit II provides a demonstration that the requested rate increase meets the 58%/85% minimum loss ratio test under moderately adverse conditions as required by post-rate stability regulation. When the majority of policies are eligible for contingent benefit upon lapse, an alternative 58%/85% test is required by rate stability regulation, where the calculation uses the greater of the original anticipated lifetime loss ratio (57%) or 58%. As the original anticipated lifetime loss ratio does not exceed 58%, an alternative 58%/85% is not provided. Exhibit II shows that the sum of the accumulated value of incurred claims without the inclusion of active life reserves, and the present value of projected incurred claims, without the inclusion of active life reserves, will not be less than the sum of the following:

1. Accumulated value of the initial earned premium times 58%,
2. 85% of the accumulated value of prior premium rate schedule increases,
3. Present value of projected initial earned premium times 58%, and
4. 85% of the present value of projected premium in excess of the projected initial earned premium.

**MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY****Address:** 1295 State Street, Springfield, MA 01111**Actuarial Memorandum****November 30, 2021**

The following table demonstrates that the 58%/85% test is passed by series. The 'All' row corresponds to that shown in Exhibit II. Values in the table are shown in millions of dollars.

**58%/85% Test by Series (\$ in millions)**

Series	Item 5 <sup>[1]</sup>	Item 7 <sup>[2]</sup>	Result <sup>[3]</sup>
All	\$3,831	\$8,531	Pass
200	932	2,539	Pass
300	835	2,314	Pass
400	842	1,753	Pass
500	937	1,514	Pass
511 <sup>[4]</sup>	285	412	Pass

[1] Item 5 is the Lifetime Earned Premium Times Prescribed Factor. Reflects rate increases approved through May 2021.

[2] Item 7 is Lifetime Incurred Claims with Rate Increase.

[3] Test of whether Item 7 is not less than Item 5.

[4] If item 7 were updated to be based on the greater of 58% and the original pricing loss ratio (69%), the 511 Series still passes this test.

This filing satisfies the rate stability requirement to provide updated projections for three years following the implementation of an increase; this is the third update of the required three years. A comparison of actual to those projected in the prior filing can be performed using the prior filing's Exhibit I and those found in Exhibit I of this actuarial memorandum. Additional detail regarding this comparison can be provided upon request.

**16. Actual-to-Expected Experience**

The following table provides a comparison of actual and projected experience using current assumptions to that expected using original pricing assumptions. Values in the following table are shown (a) before and (b) after the requested rate increase.

**Actual and Expected Loss Ratios by Series**

Series	Lifetime Loss Ratio			Actual-to-Expected	
	Before Increase <sup>[1]</sup>	After Increase <sup>[1]</sup>	Expected <sup>[2]</sup>	Before Increase	After Increase
All	129%	113%	57%	2.27	1.99
200	155	137	54	2.87	2.53
300	156	138	56	2.76	2.45
400	111	97	54	2.06	1.80
500	103	90	58	1.79	1.56
511	88	79	69	1.26	1.13

[1] Using current interest assumption on a basis that is consistent with original pricing, which may differ from that used in Exhibit I, as described below. Reflects rate increases approved through May 2021.

[2] Projected actual policies sold from issue using original pricing assumptions.

Actual and projected experience in the above table is identical to that described in Exhibit I, except uses a current interest assumption on a basis that is consistent with original pricing. For the pre-500 business, original pricing used an earnings interest rate basis; a current earnings interest rate assumption of 5.0% is used in this table. For the 500+ business, original pricing used a valuation interest rate basis, so a current maximum valuation interest rate assumption as described above in Section 6 (which is also consistent with that used in Exhibit I) is used in this table.

Expected experience uses the actual policies sold and projects from issue on a seriatim basis using the original pricing assumptions for each series. Consistent with the original pricing projections, the expected experience based on original pricing assumptions includes an adjustment for dividend margin assumed in pricing for the 500+ business.

**MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY**

**Address:** 1295 State Street, Springfield, MA 01111

**Actuarial Memorandum**

**November 30, 2021**

Exhibit III provides a comparison of the current and original pricing assumptions that underlie the actual and expected experience described above.

**17. History of Previous Rate Revisions**

Please see the enclosed cover letter, which provides the jurisdiction-specific average prior rate increase and rate history for the above-listed form(s). Section 2 above describes the nationwide average prior rate increase across the pooled experience.

**18. Analysis Performed to Consider a Rate Increase**

This rate increase request is a follow up to the 2018 nationwide rate increase request. At the time of the 2018 nationwide request, an analysis of the business was performed, which confirmed that a rate increase could be considered as experience had been more adverse than expected in original pricing.

The following table provides a comparison of actual and projected nationwide experience reflecting rate increases approved through May 2021 for all rate series combined to that expected in pricing with respect to interest, lapse (combination of voluntary lapse and benefit expiry), mortality, morbidity, and improvement. The current and original pricing assumptions are provided in Exhibit III.

**Impact of Changing from Pricing to Current Assumptions**

Scenario	Lifetime Loss Ratio (LLR)	Incremental Impact on the LLR <sup>[1]</sup>	Increase Needed <sup>[2]</sup>
Original pricing assumptions	57%	N/A	N/A
Historical experience through 2019 & projections with pricing assumptions <sup>[3]</sup>	59	5%	20%
Historical experience through 2019 & projections with pricing assumptions except for current:			
Interest	65	9	37
Interest, lapse	71	9	33
Interest, lapse, mortality	96	36	121
Interest, lapse, mortality, morbidity	135	40	128
Interest, lapse, mortality, morbidity, improvement	129	-4	-14
Historical experience through 2019 & projections with all current most-likely assumptions <sup>[4]</sup>	129	127	397

[1] Calculated as the ratio of the lifetime loss ratio in a given row to that in the row immediately above it less one.

[2] Shows the rate increase needed to reproduce the lifetime loss ratio in the row immediately above it. Calculated without regard to CBUL, RBO, adverse selection, and higher waiver claims due to the needed rate increase.

[3] This row reflects actual historical experience and pricing assumptions projected from the valuation date, reflecting prior rate increases approved through May 2021. For participating rate series (500+), the explicit dividend margin assumed in pricing was removed (reduces the lifetime loss ratio) as no dividends have been or are expected to be paid on these policy forms.

[4] This row is calculated in regards to the pricing lifetime loss ratio of 57%.

For the business subject to rate stability regulation, an analysis was performed at the time of the 2018 nationwide request demonstrating that the projected loss ratio compared to that assumed at the time of original pricing revealed that experience unfolded more than moderately adverse and crossed the original pricing threshold for which the company could consider a rate increase.

Based on our understanding of the available original pricing materials and actuarial judgment, the assumed original pricing threshold before which a rate increase may be considered is a 10% increase in the original pricing lifetime loss ratio for the pre-500 Series, a 13% increase for the 500 Series, and a 14% increase for the 511 Series. Section 15 demonstrates that the lifetime loss ratios are well in excess of this assumed original pricing threshold. That is, the before increase A:E exceeds 1.10 for the pre-500 Series, 1.13 for the 500 Series, and 1.14 for the 511 Series.

**MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY**

**Address:** 1295 State Street, Springfield, MA 01111

**Actuarial Memorandum**

**November 30, 2021**

**19. Average Annualized Premium in Pennsylvania (Based on December 31, 2019 In-Force<sup>(1)</sup>)**

The rate increase in this jurisdiction is described in the enclosed cover letter. The number of insureds and the corresponding average annualized premium that will be affected by this rate increase filing are:

Rate Series	Number of Insureds	Before Increase Premium	After Increase Premium
200 Series	2,906	\$2,186	\$3,074
400 Series	787	3,293	4,568
500 Series	1,033	3,309	4,328
511 Series	238	3,434	3,777
All	4,964	2,655	3,606

<sup>(1)</sup> Excludes policies assumed to be paid up prior to implementation of the requested rate increase.

**20. Proposed Effective Date**

This rate increase will apply to policies on their next policy anniversary date following at least a 90-day policyowner notification period following being filed for use by the department of insurance, but no sooner than 12 months after the prior rate increase was effective. No policyowner will receive more than one increase during a 12-month period.

**21. Distribution of Business as of December 31, 2019 (Based on Nationwide In-Force Insured Count)**

Issue Ages	Percent Distribution					
	All	200	300	400	500	511
<40	2%	1%	2%	2%	2%	2%
40-44	4	4	6	5	4	5
45-49	11	10	13	11	9	9
50-54	23	23	24	25	20	21
55-59	29	31	31	30	28	26
60-64	20	20	17	18	24	23
65-69	8	8	5	7	10	12
70-74	2	2	1	1	2	2
75-79	<1	<1	<1	<1	<1	<1
80+	<1	<1	<1	<1	<1	N/A
Average Issue Age	56	56	55	55	57	56

Elimination Period	Percent Distribution					
	All	200	300	400	500	511
0-Day	1%	2%	1%	1%	N/A	N/A
30-Day	8	13	12	6	3	2
60-Day	4	4	4	4	3	2
90-Day	82	81	78	82	86	91
180-Day	5	<1	5	7	8	5

**MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY**

**Address:** 1295 State Street, Springfield, MA 01111

**Actuarial Memorandum**

**November 30, 2021**

Benefit Period	Percent Distribution					
	All	200	300	400	500	511
2 Years	2%	N/A	N/A	N/A	5%	6%
3 Years	15	14	9	9	20	28
4 Years	6	N/A	5	4	13	14
5 Years	8	N/A	N/A	6	23	19
6 Years	10	12	9	6	9	23
10 Years	2	N/A	N/A	3	4	2
Lifetime	57	74	77	72	26	8

Inflation Option	Percent Distribution					
	All	200	300	400	500	511
None	10%	11%	7%	12%	12%	11%
Simple 5%	30	38	32	35	26	N/A
Compound 3%	10	N/A	N/A	N/A	16	73
Compound 5%	50	51	61	53	46	16

Premium Payment Duration	Percent Distribution					
	All	200	300	400	500	511
Ten-Pay	13%	11%	18%	16%	13%	6%
Twenty-Pay	1	1	1	1	N/A	N/A
Pay to Age 65	<1	N/A	N/A	N/A	2	1
Lifetime-Pay	86	88	81	83	85	93

Discounted Renewal Premium Payment Option	Option Election Rate					
	All	200	300	400	500	511
	4%	5%	5%	7%	1%	<1%

Coverage Type	Percent Distribution					
	All	200	300	400	500	511
Facility Only	1%	2%	1%	1%	2%	1%
Comprehensive	99	98	99	99	98	99

Benefit Type	Percent Distribution					
	All	200	300	400	500	511
Indemnity	29%	22%	46%	46%	19%	N/A
Reimbursement	71	78	54	54	81	100

Underwriting Class <sup>[1]</sup>	Percent Distribution					
	All	200	300	400	500	511
Preferred	60%	76%	62%	58%	48%	42%
Standard	34	20	33	37	44	48
Substandard	6	4	5	5	8	10

[1] At issue, the labels may have differed, but were grouped into these three generic labels.

**MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY****Address:** 1295 State Street, Springfield, MA 01111**Actuarial Memorandum****November 30, 2021****22. Number of Insureds and Annualized Premium (Based on December 31, 2019 In-Force<sup>[1]</sup>)**

The number of insureds and annualized premium that will be affected by this rate increase filing are:

Series	Number of Insureds	Annualized Premium <sup>[2]</sup>
Pennsylvania		
200	2,906	\$6,353,218
400	787	2,591,520
500	1,033	3,417,783
511	238	817,242
Total	4,964	13,179,763
Nationwide		
200	16,989	41,643,727
300	13,635	39,455,055
400	11,756	42,723,680
500	15,449	56,536,827
511	6,234	20,283,512
Total	64,063	200,642,801

[1] Excludes policies assumed to be paid up prior to implementation of the requested rate increase.

[2] Reflects rate increases approved through May 2021.



**MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY**

**Address:** 1295 State Street, Springfield, MA 01111

**Actuarial Memorandum**

**November 30, 2021**

**23. Actuarial Certification**

I am a Principal and Consulting Actuary for Milliman, Inc. and retained by MassMutual to render an opinion with regard to long-term care insurance rates. I am a member of the American Academy of Actuaries. I meet the Academy's qualification standards to render this actuarial opinion and am familiar with the requirements for filing long-term care insurance premiums and rate increases.

This memorandum has been prepared in conformity with Actuarial Standards of Practice No. 8, "Regulatory Filings for Health Benefits, Accident and Health Insurance, and Entities Providing Health Benefits" and 18, "Long-Term Care Insurance" and other applicable standards.

I hereby certify that, to the best of my knowledge and judgment, this rate submission is in compliance with the applicable laws and regulations of this jurisdiction and the rules of the department of insurance. In my opinion, the rates are not excessive or unfairly discriminatory, and bear reasonable relationship to the benefits based on the loss ratio standards of this jurisdiction. This filing will enhance premium adequacy but may not be sufficient to prevent future rate action. Additional rate increases are needed to certify that rates will remain stable under moderately adverse conditions.

In forming my opinion, I have used actuarial assumptions and actuarial methods (which gave consideration to policy design, underwriting, and claim adjudication) and such tests of the actuarial calculations as I considered necessary. Based on these assumptions, or statutory requirements where necessary, the premium rate filing is in compliance with the loss ratio standards of this jurisdiction.

Certain models were developed to estimate the values included in this filing. The intent of the models was to estimate future experience. I have reviewed the models for consistency, reasonableness, and appropriateness to the intended purpose and in compliance with generally accepted actuarial practice and relevant actuarial standards of practice.

I have relied on data and information provided by MassMutual and its third-party administrator to develop this filing, including but not limited to management's view of when a rate change may be considered, policy design, underwriting and claim adjudication process, seriatim in-force data, claim data, dividend expectation, and the company's long-term earnings rate. I have not audited or verified this data and other information. If the underlying data or information is inaccurate or incomplete, the results of this filing may likewise be inaccurate or incomplete.

The basis for contract reserves has been previously filed and there is no anticipation of any changes.



Missy Gordon, FSA, MAAA  
Principal and Consulting Actuary

**Date:** November 30, 2021

This filing has been prepared solely for the use and benefit of MassMutual. Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit any third-party recipient of its work product, even if Milliman consents to the release of its work product to such third party.

Milliman's work is being delivered to the department, in accordance with its statutory and regulatory requirements. Milliman recognizes that materials it delivers to the department may be public records subject to disclosure to third parties, however, Milliman does not intend to benefit and assumes no duty or liability to any third parties, including the department, who receive Milliman's work and may include disclaimer language on its work product so stating. The department agrees not to remove any such disclaimer language from Milliman's work. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, the department agrees that it shall not disclose Milliman's work product to third parties without Milliman's prior written consent; provided, however, that the department may distribute Milliman's work to (i) its professional service providers who are subject to a duty of confidentiality and who agree to not use Milliman's work product for any purpose other than to provide services to the department, or (ii) any applicable regulatory or governmental agency, as required.

A limited review was performed of the data used directly in this filing for reasonableness and consistency and no material defects in the data were found. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of this assignment.

Differences between the projections in this filing and actual amounts depend on the extent to which future experience conforms to the assumptions made for this analysis. It is certain that actual experience will not conform exactly to the assumptions used in this analysis. Actual amounts will differ from projected amounts to the extent that actual experience deviates from expected experience.

Milliman recommends recipient be aided by its own actuary or other qualified professional when reviewing the Milliman work product.

**Exhibit I-a**  
**Massachusetts Mutual Life Insurance Company**  
**Actual and Projected Experience by Calendar Year**  
**Nationwide Experience Before Requested Rate Increase**  
**All Rate Series Combined**

	Calendar Year	Without Interest			D End of Year Lives	With Max. Val. Interest		
		A	B	C = B / A		E	F	G = F / E
		Earned Premium	Incurred Claims	Incurred Loss Ratio		Earned Premium	Incurred Claims	Incurred Loss Ratio
Historical Experience	2000	613,240	0	0%	1,775	1,446,765	0	0%
	2001	8,383,016	64,652	1%	7,635	18,925,688	145,960	1%
	2002	21,390,485	524,902	2%	15,504	46,212,102	1,134,000	2%
	2003	38,387,225	1,705,214	4%	24,542	79,360,704	3,525,313	4%
	2004	58,559,259	1,499,223	3%	34,040	115,850,543	2,965,985	3%
	2005	88,589,065	6,151,316	7%	45,049	167,712,846	11,645,396	7%
	2006	108,269,558	3,965,336	4%	50,038	195,052,654	7,183,728	4%
	2007	121,853,024	9,302,543	8%	54,355	208,584,078	16,087,895	8%
	2008	137,132,224	9,425,421	7%	58,767	223,628,520	15,556,758	7%
	2009	146,737,674	14,920,550	10%	61,207	228,656,687	23,554,140	10%
	2010	156,994,117	18,556,754	12%	64,681	233,966,443	28,117,743	12%
	2011	169,923,956	18,633,752	11%	70,244	242,244,588	26,944,095	11%
	2012	193,185,040	22,275,241	12%	77,290	263,404,491	30,879,374	12%
	2013	201,090,592	24,296,952	12%	79,378	262,572,319	32,148,888	12%
	2014	196,050,128	35,607,782	18%	78,504	245,452,552	45,160,766	18%
	2015	183,683,441	44,629,852	24%	77,731	220,582,313	54,223,351	25%
	2016	174,815,054	39,553,195	23%	76,871	201,512,171	46,050,070	23%
	2017	167,930,921	55,868,775	33%	76,099	185,881,252	62,258,220	33%
	2018	160,748,844	57,100,691	36%	75,145	170,855,483	60,902,354	36%
	2019	156,587,832	69,990,110	45%	73,816	159,805,176	71,508,888	45%
Projected Future Experience	2020	162,066,714	88,198,984	54%	72,195	158,796,169	86,329,045	54%
	2021	163,438,416	101,510,557	62%	70,049	153,733,806	95,195,535	62%
	2022	166,168,627	115,016,805	69%	68,275	150,010,197	103,350,571	69%
	2023	170,256,373	132,164,020	78%	66,994	147,516,657	113,798,419	77%
	2024	169,358,513	151,611,450	90%	65,656	140,852,760	125,098,564	89%
	2025	165,927,930	173,299,070	104%	64,246	132,476,703	137,038,242	103%
	2026	161,738,223	197,139,301	122%	62,763	123,968,192	149,408,908	121%
	2027	157,308,598	223,440,483	142%	61,202	115,754,402	162,313,741	140%
	2028	152,695,587	252,334,549	165%	59,561	107,874,647	175,709,384	163%
	2029	147,971,832	283,693,328	192%	57,837	100,370,473	189,380,464	189%
	2030	143,162,180	318,893,800	223%	56,022	93,244,097	204,103,598	219%
	2031	138,116,461	357,946,570	259%	54,108	86,384,253	219,680,075	254%
	2032	132,806,917	398,443,510	300%	52,097	79,769,653	234,517,057	294%
	2033	127,311,303	440,111,576	346%	49,993	73,443,108	248,470,911	338%
	2034	121,588,777	482,358,264	397%	47,800	67,372,668	261,251,129	388%
	2035	115,648,415	523,798,350	453%	45,526	61,556,977	272,207,075	442%
	2036	109,500,603	563,379,499	514%	43,180	55,994,300	280,967,912	502%
	2037	103,232,287	600,324,985	582%	40,774	50,720,430	287,375,603	567%
	2038	96,845,094	633,770,657	654%	38,323	45,723,005	291,266,171	637%
	2039	90,374,141	662,498,111	733%	35,844	41,005,476	292,363,619	713%
	2040	83,875,173	685,160,120	817%	33,354	36,578,453	290,397,880	794%
	2041	77,390,818	701,332,773	906%	30,872	32,443,663	285,539,898	880%
	2042	70,981,378	710,856,002	1,001%	28,418	28,608,186	278,055,736	972%
	2043	64,702,197	713,479,784	1,103%	26,010	25,074,311	268,160,791	1,069%
	2044	58,602,679	709,249,287	1,210%	23,667	21,839,926	256,172,682	1,173%
	2045	52,732,282	698,344,503	1,324%	21,408	18,901,392	242,430,141	1,283%
	2046	47,135,079	681,136,057	1,445%	19,248	16,251,955	227,289,837	1,399%
	2047	41,848,950	658,204,646	1,573%	17,200	13,881,967	211,136,873	1,521%
	2048	36,903,536	629,899,485	1,707%	15,275	11,778,796	194,244,545	1,649%
	2049	32,320,407	597,375,105	1,848%	13,482	9,927,429	177,106,555	1,784%
	2050	28,113,192	561,360,148	1,997%	11,827	8,311,082	160,026,102	1,925%
	2051	24,287,015	523,101,551	2,154%	10,311	6,911,471	143,395,727	2,075%
	2052	20,837,647	483,427,653	2,320%	8,934	5,708,995	127,433,726	2,232%
	2053	17,756,143	443,145,060	2,496%	7,695	4,684,295	112,330,349	2,398%
	2054	15,028,957	403,096,630	2,682%	6,589	3,818,413	98,260,270	2,573%
	2055-2059	45,066,260	1,458,502,425	3,236%	20,494	10,396,642	319,885,674	3,077%
	2060-2064	16,524,317	741,822,488	4,489%	8,136	3,178,070	134,519,966	4,233%
	2065-2069	5,501,675	325,341,137	5,913%	2,924	884,528	48,999,263	5,540%
	2070-2074	1,718,128	124,424,058	7,242%	979	231,129	15,680,710	6,784%
	2075-2079	496,020	40,283,774	8,121%	311	55,656	4,271,194	7,674%
History		2,490,924,694	434,072,261	17%		3,471,707,374	539,992,924	16%
Future		3,537,338,844	18,589,476,554	526%		2,246,034,333	7,525,163,942	335%
Lifetime		6,028,263,538	19,023,548,814	316%		5,717,741,707	8,065,156,866	141%

**Exhibit I-b**  
**Massachusetts Mutual Life Insurance Company**  
**Actual and Projected Experience by Calendar Year**  
**Nationwide Experience After Requested Rate Increase**  
**All Rate Series Combined**

	Calendar Year	Without Interest			D End of Year Lives	With Max. Val. Interest		
		A Earned Premium	B Incurred Claims	C = B / A Incurred Loss Ratio		E Earned Premium	F Incurred Claims	G = F / E Incurred Loss Ratio
Historical Experience	2000	613,240	0	0%	1,775	1,446,765	0	0%
	2001	8,383,016	64,652	1%	7,635	18,925,688	145,960	1%
	2002	21,390,485	524,902	2%	15,504	46,212,102	1,134,000	2%
	2003	38,387,225	1,705,214	4%	24,542	79,360,704	3,525,313	4%
	2004	58,559,259	1,499,223	3%	34,040	115,850,543	2,965,985	3%
	2005	88,589,065	6,151,316	7%	45,049	167,712,846	11,645,396	7%
	2006	108,269,558	3,965,336	4%	50,038	195,052,654	7,183,728	4%
	2007	121,853,024	9,302,543	8%	54,355	208,584,078	16,087,895	8%
	2008	137,132,224	9,425,421	7%	58,767	223,628,520	15,556,758	7%
	2009	146,737,674	14,920,550	10%	61,207	228,656,687	23,554,140	10%
	2010	156,994,117	18,556,754	12%	64,681	233,966,443	28,117,743	12%
	2011	169,923,956	18,633,752	11%	70,244	242,244,588	26,944,095	11%
	2012	193,185,040	22,275,241	12%	77,290	263,404,491	30,879,374	12%
	2013	201,090,592	24,296,952	12%	79,378	262,572,319	32,148,888	12%
	2014	196,050,128	35,607,782	18%	78,504	245,452,552	45,160,766	18%
	2015	183,683,441	44,629,852	24%	77,731	220,582,313	54,223,351	25%
	2016	174,815,054	39,553,195	23%	76,871	201,512,171	46,050,070	23%
	2017	167,930,921	55,868,775	33%	76,099	185,881,252	62,258,220	33%
	2018	160,748,844	57,100,691	36%	75,145	170,855,483	60,902,354	36%
	2019	156,587,832	69,990,110	45%	73,816	159,805,176	71,508,888	45%
Projected Future Experience	2020	162,066,714	88,198,984	54%	72,195	158,796,169	86,329,045	54%
	2021	163,438,416	101,510,557	62%	70,049	153,733,806	95,195,535	62%
	2022	174,896,422	113,240,125	65%	66,884	157,895,819	101,754,283	64%
	2023	198,924,712	124,105,657	62%	64,683	172,369,402	106,865,975	62%
	2024	201,804,803	140,296,851	70%	63,260	167,850,704	115,774,227	69%
	2025	198,851,436	159,358,666	80%	61,792	158,777,337	126,031,969	79%
	2026	194,452,443	180,479,374	93%	60,347	149,056,183	136,806,821	92%
	2027	189,121,201	204,401,519	108%	58,851	139,177,807	148,514,277	107%
	2028	183,549,763	230,735,211	126%	57,279	129,687,351	160,707,555	124%
	2029	177,855,607	259,324,095	146%	55,627	120,656,815	173,159,647	144%
	2030	172,049,995	291,432,663	169%	53,887	112,075,625	186,584,034	166%
	2031	165,955,376	327,079,207	197%	52,053	103,812,490	200,803,566	193%
	2032	159,544,330	364,069,103	228%	50,126	95,845,780	214,364,204	224%
	2033	152,923,680	402,164,628	263%	48,109	88,234,693	227,139,429	257%
	2034	146,036,390	440,845,056	302%	46,007	80,935,300	238,872,376	295%
	2035	138,888,547	478,847,841	345%	43,826	73,942,925	248,966,269	337%
	2036	131,499,197	515,225,524	392%	41,577	67,258,832	257,085,302	382%
	2037	123,961,010	549,264,604	443%	39,269	60,919,608	263,079,114	432%
	2038	116,281,010	580,184,741	499%	36,918	54,913,102	266,798,129	486%
	2039	108,498,878	606,868,512	559%	34,539	49,242,244	267,984,327	544%
	2040	100,688,601	628,086,336	624%	32,149	43,923,012	266,387,771	606%
	2041	92,896,624	643,425,261	693%	29,766	38,955,154	262,151,343	673%
	2042	85,196,938	652,730,385	766%	27,407	34,347,802	255,512,743	744%
	2043	77,655,385	655,752,886	844%	25,094	30,103,362	246,660,318	819%
	2044	70,330,760	652,526,053	928%	22,842	26,219,036	235,881,322	900%
	2045	63,282,109	643,185,625	1,016%	20,669	22,690,297	223,475,832	985%
	2046	56,562,187	628,041,274	1,110%	18,590	19,508,954	209,761,627	1,075%
	2047	50,216,451	607,584,751	1,210%	16,619	16,663,392	195,081,264	1,171%
	2048	44,280,324	582,130,773	1,315%	14,765	14,138,373	179,687,190	1,271%
	2049	38,779,608	552,740,345	1,425%	13,037	11,915,828	164,036,197	1,377%
	2050	33,730,417	520,062,371	1,542%	11,441	9,975,521	148,404,570	1,488%
	2051	29,138,874	485,242,598	1,665%	9,979	8,295,482	133,156,475	1,605%
	2052	25,000,027	449,017,227	1,796%	8,651	6,852,201	118,489,380	1,729%
	2053	21,302,761	412,140,324	1,935%	7,454	5,622,334	104,585,102	1,860%
	2054	18,030,902	375,397,081	2,082%	6,385	4,583,142	91,609,702	1,999%
	2055-2059	54,074,118	1,363,328,535	2,521%	19,885	12,480,741	299,324,000	2,398%
	2060-2064	19,838,885	697,836,780	3,518%	7,910	3,817,677	126,681,592	3,318%
	2065-2069	6,615,580	307,705,781	4,651%	2,847	1,064,193	46,390,587	4,359%
	2070-2074	2,071,512	118,176,811	5,705%	955	278,815	14,903,767	5,345%
	2075-2079	599,737	38,369,390	6,398%	304	67,351	4,068,383	6,041%
History		2,490,924,694	434,072,261	17%		3,471,707,374	539,992,924	16%
Future		4,150,891,728	17,171,113,504	414%		2,606,684,661	6,949,065,250	267%
Lifetime		6,641,816,422	17,605,185,765	265%		6,078,392,035	7,489,058,174	123%

**Exhibit II**  
**Demonstration that the Requested Rate Increase Passes the 58%/85% Loss Ratio Minimum**  
**Massachusetts Mutual Life Insurance Company**  
**All Rate Series Combined Nationwide Experience**

1	Accumulated value of initial earned premium	3,469,471,203	x	58%	=	2,012,293,297
2a	Accumulated value of earned premium	3,471,707,374				
2b	Accumulated value of prior premium rate schedule increases (2a - 1)	2,236,171	x	85%	=	1,900,746
3	Present value of future projected initial earned premium	1,477,761,234	x	58%	=	857,101,516
4a	Present value of future projected premium	2,606,684,661				
4b	Present value of future projected premium in excess of the projected initial earned premiums (4a - 3)	1,128,923,427	x	85%	=	959,584,913
5	Lifetime Earned Premium Times Prescribed Factor: Sum of 1, 2b, 3, and 4b					3,830,880,472
6a	Accumulated value of incurred claims without the inclusion of active life reserves					539,992,924
6b	Present value of future projected incurred claims without the inclusion of active life reserves					7,991,425,037
7	Lifetime Incurred Claims with Rate Increase: Sum 6a and 6b					8,531,417,961
8	Test: 7 is not less than 5					Pass

Items 2a, 4a, and 6a are consistent with the accumulated and present values shown in Exhibit I-b.

All accumulated or present values use the maximum valuation interest rate for contract reserves applicable for the year of issue, which ranges from 3.5% to 4.5%.

Item 3 reflects the impact of CBUL and RBO to align persistency with that in Item 4a.

Item 6b is 15% higher than incurred claims shown in Exhibit I-b to reflect moderately adverse conditions.

**Exhibit III**  
**Massachusetts Mutual Life Insurance Company**  
**Comparison of Current and Original Pricing Assumptions**

		Morbidity															
Current Assumptions	All	Claim costs are developed using the 2014 Milliman <i>Long-Term Care Guidelines (Guidelines)</i> with adjustments for underwriting selection and an all-lives exposure basis. The claim costs were further adjusted based on historical claim experience by rate series, attained age, policy duration, benefit period, benefit payment type, gender, and underwriting class, to the extent credible. An exhibit containing the adjustment factors is provided in Appendix A to the actuarial memorandum.															
Original Assumptions	200 Series 300 Series 400 Series	Claim costs were developed using The Reports of the Society of Actuaries and actuarial judgment. The following are durational morbidity factors: <table><tr><th>Duration</th><th>Factor</th></tr><tr><td>1</td><td>0.10</td></tr><tr><td>2</td><td>0.20</td></tr><tr><td>3</td><td>0.40</td></tr><tr><td>4</td><td>0.60</td></tr><tr><td>5</td><td>0.80</td></tr><tr><td>6+</td><td>1.00</td></tr></table>		Duration	Factor	1	0.10	2	0.20	3	0.40	4	0.60	5	0.80	6+	1.00
	Duration	Factor															
	1	0.10															
2	0.20																
3	0.40																
4	0.60																
5	0.80																
6+	1.00																
	500 Series	Claim costs were developed starting with the 400 Series claim costs and were modified based on experience of the company's reinsurance carrier.															
	511 Series	The morbidity assumption was derived using industry experience as reported in the Intercompany Study 1984-2004 published by the Society of Actuaries Long Term Care Experience Committee (2004 Study) and adjusted, to the extent credible, by the aggregate experience of the company's reinsurer.															

		Mortality	
Current Assumptions	All	Mortality Rates reflect the 2012 Individual Annuity Mortality Basic gender-distinct table (2012IAM). The mortality rates were adjusted based on historical experience by attained age, policy duration, gender, underwriting class, and partner status, to the extent credible. An exhibit containing the adjustment factors is provided in Appendix A to the actuarial memorandum.	
Original Assumptions	200 Series 300 Series 400 Series	1975-80 Select and Ultimate mortality table.	
	500 Series	1994 Group Annuity Mortality (GAM) Static gender-distinct table.	
		80% of Annuity 2000 (A2000) Mortality table is used for active lives along with underwriting selection. Disabled Life Mortality is assumed to be the lesser of the claim termination rate and a multiple of the active mortality rate. The multiple varies by claim termination age. For claim termination ages less than or equal to 75, the multiple is 20.0. For claim termination ages greater than 90, the multiple is 5.0. The multiple grades linearly from ages 75 to 90.	
		511 Series	A2000 Mortality table is used for active lives along with adjustments by attained age and gender. The disabled mortality assumption is derived using industry experience as reported in the 2004 Study.

**Exhibit III**  
**Massachusetts Mutual Life Insurance Company**  
**Comparison of Current and Original Pricing Assumptions**

Current Assumptions	All	Lapse Rates																																			
		Voluntary lapse rates (excludes benefit expiry) vary by policy duration and partner status.																																			
		<table><tr><th colspan="3">Lifetime-Payment Lapse Rates</th></tr><tr><th>Duration</th><th>Single</th><th>Partnered</th></tr><tr><td>1</td><td>4.00%</td><td>1.50%</td></tr><tr><td>2</td><td>5.50%</td><td>2.50%</td></tr><tr><td>3</td><td>3.50%</td><td>2.00%</td></tr><tr><td>4</td><td>3.00%</td><td>1.50%</td></tr><tr><td>5</td><td>2.50%</td><td>1.20%</td></tr><tr><td>6</td><td>2.00%</td><td>0.90%</td></tr><tr><td>7</td><td>1.75%</td><td>0.70%</td></tr><tr><td>8</td><td>1.25%</td><td>0.60%</td></tr><tr><td>9+</td><td>0.90%</td><td>0.50%</td></tr></table>			Lifetime-Payment Lapse Rates			Duration	Single	Partnered	1	4.00%	1.50%	2	5.50%	2.50%	3	3.50%	2.00%	4	3.00%	1.50%	5	2.50%	1.20%	6	2.00%	0.90%	7	1.75%	0.70%	8	1.25%	0.60%	9+	0.90%	0.50%
Lifetime-Payment Lapse Rates																																					
Duration	Single	Partnered																																			
1	4.00%	1.50%																																			
2	5.50%	2.50%																																			
3	3.50%	2.00%																																			
4	3.00%	1.50%																																			
5	2.50%	1.20%																																			
6	2.00%	0.90%																																			
7	1.75%	0.70%																																			
8	1.25%	0.60%																																			
9+	0.90%	0.50%																																			
		For the ten-pay option, a reduction of 50% of the above lapse rates is assumed for durations one through eight, and 0% lapse thereafter. For the twenty-pay option, a reduction of 25% of the above lapse rates is assumed for durations one through fifteen, and 0% lapse thereafter. For the paid up at age 65 option, a reduction of 25% of these lapse rates was assumed until age 60, and 0% lapse thereafter. For the non-level payment option, a reduction of 25% of the above lapse rates is assumed for all durations.																																			

Original Assumptions	200 Series 300 Series	Lapse Rates														
	Lapse rates vary by duration. Lapse rates for the lifetime-payment option are provided in the table below.															
		<table><tr><th>Duration</th><th>Lapse Rates</th></tr><tr><td>1</td><td>8.00%</td></tr><tr><td>2</td><td>6.00%</td></tr><tr><td>3</td><td>5.00%</td></tr><tr><td>4</td><td>4.00%</td></tr><tr><td>5+</td><td>3.50%</td></tr></table>			Duration	Lapse Rates	1	8.00%	2	6.00%	3	5.00%	4	4.00%	5+	3.50%
Duration	Lapse Rates															
1	8.00%															
2	6.00%															
3	5.00%															
4	4.00%															
5+	3.50%															
		For limited-pay policies, 2.00% lapse is assumed during the premium payment period.														

Original Assumptions	400 Series	Lapse Rates																																																																										
	Lapse rates vary by duration.																																																																											
		<table><tr><th rowspan="2">Duration</th><th colspan="3">Lapse Rates</th></tr><tr><th>Lifetime</th><th>10 Pay</th><th>20 Pay</th></tr><tr><td>1</td><td>7.00%</td><td>2.00%</td><td>2.00%</td></tr><tr><td>2</td><td>4.00%</td><td>2.00%</td><td>2.00%</td></tr><tr><td>3</td><td>3.00%</td><td>2.00%</td><td>2.00%</td></tr><tr><td>4</td><td>2.50%</td><td>2.00%</td><td>2.00%</td></tr><tr><td>5</td><td>2.00%</td><td>2.00%</td><td>2.00%</td></tr><tr><td>6</td><td>2.00%</td><td>1.50%</td><td>1.50%</td></tr><tr><td>7</td><td>2.00%</td><td>1.25%</td><td>1.25%</td></tr><tr><td>8</td><td>2.00%</td><td>1.00%</td><td>1.00%</td></tr><tr><td>9</td><td>2.00%</td><td>1.00%</td><td>1.00%</td></tr><tr><td>10</td><td>2.00%</td><td>0.00%</td><td>1.00%</td></tr><tr><td>11</td><td>2.00%</td><td>0.00%</td><td>1.00%</td></tr><tr><td>12</td><td>2.00%</td><td>0.00%</td><td>1.00%</td></tr><tr><td>13</td><td>2.00%</td><td>0.00%</td><td>1.00%</td></tr><tr><td>14</td><td>2.00%</td><td>0.00%</td><td>1.00%</td></tr><tr><td>15</td><td>2.00%</td><td>0.00%</td><td>1.00%</td></tr><tr><td>16+</td><td>2.00%</td><td>0.00%</td><td>0.00%</td></tr></table>				Duration	Lapse Rates			Lifetime	10 Pay	20 Pay	1	7.00%	2.00%	2.00%	2	4.00%	2.00%	2.00%	3	3.00%	2.00%	2.00%	4	2.50%	2.00%	2.00%	5	2.00%	2.00%	2.00%	6	2.00%	1.50%	1.50%	7	2.00%	1.25%	1.25%	8	2.00%	1.00%	1.00%	9	2.00%	1.00%	1.00%	10	2.00%	0.00%	1.00%	11	2.00%	0.00%	1.00%	12	2.00%	0.00%	1.00%	13	2.00%	0.00%	1.00%	14	2.00%	0.00%	1.00%	15	2.00%	0.00%	1.00%	16+	2.00%	0.00%	0.00%
Duration	Lapse Rates																																																																											
	Lifetime	10 Pay	20 Pay																																																																									
1	7.00%	2.00%	2.00%																																																																									
2	4.00%	2.00%	2.00%																																																																									
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4	2.50%	2.00%	2.00%																																																																									
5	2.00%	2.00%	2.00%																																																																									
6	2.00%	1.50%	1.50%																																																																									
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15	2.00%	0.00%	1.00%																																																																									
16+	2.00%	0.00%	0.00%																																																																									

**Exhibit III**  
**Massachusetts Mutual Life Insurance Company**  
**Comparison of Current and Original Pricing Assumptions**

**Lapse Rates Continued**

Voluntary lapse rates vary by duration and issue age. Lapse rates for the lifetime-payment option are provided in the table below.

Duration	Lifetime-Payment Lapse Rates									
	Issue Ages									
	<40	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80+
1	7.50%	5.50%	3.75%	3.00%	2.50%	2.50%	3.25%	4.50%	5.50%	7.75%
2	5.75%	4.25%	3.00%	2.25%	2.00%	2.00%	2.50%	3.50%	4.50%	6.00%
3	4.25%	3.25%	2.25%	1.75%	1.50%	1.50%	1.75%	2.50%	3.25%	4.25%
4	3.25%	2.25%	1.75%	1.25%	1.00%	1.00%	1.25%	2.00%	2.50%	3.25%
5	2.00%	1.50%	1.00%	0.75%	0.75%	0.75%	1.00%	1.25%	1.50%	2.25%
6	1.75%	1.25%	0.75%	0.65%	0.65%	0.65%	0.75%	1.00%	1.25%	2.00%
7	1.50%	1.00%	0.65%	0.65%	0.65%	0.65%	0.65%	0.75%	1.00%	1.75%
8	1.25%	0.75%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.75%	1.50%
9	1.00%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	1.25%
10	0.75%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	1.00%
11	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.75%
12+	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%

For limited-pay policies, the voluntary lapse rates are 3.5% in the first year and 0% thereafter.

Voluntary lapse rates vary by duration and issue age.

Duration	Lifetime-Payment Lapse Rates									
	Issue Ages									
	<40	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80+
1	8.60%	4.50%	3.70%	3.55%	2.85%	3.50%	3.50%	3.85%	4.05%	3.55%
2	5.55%	4.15%	3.60%	2.90%	2.40%	2.35%	2.75%	3.15%	3.00%	3.10%
3	3.55%	3.00%	2.25%	2.10%	1.80%	1.85%	1.95%	1.95%	2.05%	2.05%
4	3.30%	2.05%	2.15%	1.70%	1.50%	1.55%	1.60%	1.80%	1.85%	1.75%
5	2.15%	1.95%	1.70%	1.35%	1.05%	1.00%	1.20%	1.15%	1.20%	1.35%
6	2.15%	1.95%	1.60%	1.10%	1.00%	1.00%	1.10%	1.15%	1.15%	1.25%
7	2.15%	1.95%	1.60%	1.10%	1.00%	1.00%	1.10%	1.15%	1.15%	1.25%
8	1.35%	1.35%	1.25%	1.05%	0.95%	0.90%	0.95%	1.05%	1.00%	1.00%
9	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%
10	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%
11+	0.55%	0.55%	0.55%	0.55%	0.55%	0.55%	0.55%	0.55%	0.55%	0.55%

Duration	Limited-Payment Lapse Rates									
	Issue Ages									
	<40	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80+
1	3.20%	2.65%	2.30%	2.00%	1.85%	1.90%	2.15%	2.30%	2.35%	2.15%
2	2.85%	2.45%	2.05%	1.75%	1.55%	1.60%	1.70%	1.90%	2.00%	1.85%
3	2.30%	1.80%	1.55%	1.20%	1.10%	1.20%	1.25%	1.30%	1.70%	1.30%
4	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
5	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%
6	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%
7	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%
8+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

**Exhibit III**  
**Massachusetts Mutual Life Insurance Company**  
**Comparison of Current and Original Pricing Assumptions**

Current Assumptions	All
Original Assumptions	All

Benefit Expiry Rates	
Benefit expiry rates reflect assumed policy termination due to exhaustion of benefits on limited benefit period policies. The rates are based on the 2014 <i>Guidelines</i> and vary by gender, benefit period, and attained age. A table containing the benefit expiry rates is provided in Section 6 of the actuarial memorandum.	
An explicit benefit expiry assumption was not included in the original pricing memoranda.	

Current Assumptions	All
Original Assumptions	200 Series 300 Series 400 Series 500 Series 511 Series

Interest Rate		
Series	Maximum Valuation at Issue <sup>[1]</sup>	Current <sup>[2]</sup>
200	4.5%	5.0%
300	4.5%	5.0%
400	4.1%	5.0%
500	4.0%	4.0%
511	3.7%	3.7%
<sup>[1]</sup> Average interest rates by series are shown. Interest rate varies by policy from 3.5% to 4.5% and is based on policy issue date.		
<sup>[2]</sup> Basis that is consistent with original pricing, which is earnings rate for pre-500 and maximum valuation rate for 500+.		
6.5% earnings rate 6.0% earnings rate 5.0% earnings rate 4.0% maximum valuation rate 4.0% maximum valuation rate		

Current Assumptions	All
Original Assumptions	All

Improvement	
Annual improvement in the mortality and morbidity assumptions is assumed for 10 future years. Annual improvement factors vary by attained age based on the G2 improvement scale from the 2012IAM table.	
An annual improvement assumption was not included in pricing.	



## Appendix A

### Development and Justification of Current Assumptions

The current actuarial assumptions used in this rate increase filing were developed independently by Milliman and reflect the actuarial judgment and opinions of the signing actuary of this filing. The persistency and morbidity assumptions were developed using historical experience on MassMutual policies. Where actual experience had low credibility or did not exist, experience on other policy forms issued by MassMutual or industry experience was considered. Historical experience through 2016 was used in the assumption development and morbidity experience included claim runout through 2017. Consideration was given to whether adjustments were needed to the current morbidity and persistency assumptions given the additional years of experience that have become available in the time since the assumptions were developed. Experience on all of MassMutual's long-term care products available at the time of development, including its recently marketed 513 Series product, was combined in determining the assumptions described herein. As such, for the purposes of this Appendix, "500+ Series" experience is defined as the combined experience of the 500, 511, and 513 Series.

Improvement (mortality and morbidity), benefit expiry, and rate increase dependent assumptions were developed using industry experience and actuarial judgment.

Predictive analytics was used in the development of the mortality and morbidity assumptions. The voluntary lapse assumption utilized traditional techniques and credibility measures.

The rest of this appendix provides details on the development and justification of the current assumptions.

#### Persistency

The assumptions for mortality and voluntary lapse were developed based on MassMutual's historical experience through 2016. The benefit expiry assumption was developed using the 2014 Milliman *Long-Term Care Guidelines (Guidelines)*.

#### Mortality

The mortality assumption utilizes the 2012 Individual Annuity Mortality Basic gender-distinct table (2012IAM) and experience-adjustment factors to be applied to 2012IAM. To develop the experience-adjustment factors, we used predictive analytics as described in the Predictive Analytics section below.

Exhibit A-1 supports the mortality assumption and provides the following information for all rate series by partner (marital) status, gender, policy duration, attained age band, underwriting class, and rate series:

- Exhibit A-1a – Provides the adjustment factors that are to be applied to the 2012IAM hazard rates; the adjusted hazard rates are converted back into mortality probabilities to create the adjusted mortality assumption.
- Exhibit A-1b
  - Policy year exposure [A] reflects the length of time a covered life is exposed to the risk of death (i.e., exact exposure basis).
  - Actual deaths [B]
  - Mortality probabilities underlying actual experience [C], 2012IAM [D], and the adjusted assumption [E]  
Mortality probabilities were calculated by first calculating the hazard rate of mortality, then transforming into a probability. For example, the actual mortality probability  $[C] = 1 - \text{EXP}(-[B] / [A])$ .
  - Actual-to-expected (A:E) ratios are calculated as actual mortality probabilities to the 2012IAM mortality probabilities [F] and the adjusted assumption [G]. The adjusted A:E [G] provides an indication of fit. This fit will not be perfect (i.e., ratio deviates from 1.0) because the main goal is to develop an assumption that generalizes well to new data by balancing assumption complexity and fit on the historical experience.

#### Lifetime-Pay Voluntary Lapse

Exhibit A-2a(i) provides total exposure, composite termination probabilities, expected mortality probabilities, derived voluntary lapse probabilities, credibility percent, and smoothed voluntary lapse probabilities for single (without a partner) policies by duration. This exhibit includes experience for policies with a lifetime premium payment option. Exhibit A-2a(ii) provides similar information for partnered (married) policies.

In general, the smoothed voluntary lapse probabilities were set in such a way that the combined-duration smoothed probabilities were close to the derived voluntary lapse probabilities (see the rows at the bottom of the exhibits). In

## **Appendix A**

### **Development and Justification of Current Assumptions**

developing the ultimate (duration 9+) voluntary lapse probability, the actual voluntary lapse experience was considered, to the extent credible.

To develop derived voluntary lapse probabilities, the actual composite terminations were used, where composite terminations represent all terminations with the exclusion of benefit expiries; a separate benefit expiry assumption was developed based on the *Guidelines* as described below.

The actual composite termination probabilities were calculated by transforming hazard rates as follows:

$$\text{Annualized Composite Termination Probability} = 1 - \text{EXP}(-(\text{Actual Composite Termination} / \text{Exposure}))$$

Actual composite terminations (excluding benefit expiry) were assigned to the duration in which it occurred. Each death or voluntary lapse contributes 1.0 to the actual termination count. Exposure reflects an exact exposure basis.

The expected mortality probability corresponds to that underlying the adjusted assumption described in the Mortality section above; that is, 2012IAM with the experience-adjustment factors in Exhibit A-1a.

The derived voluntary lapse probability was then calculated according to the following formula:

$$\text{Derived Voluntary Lapse Probability} = 1 - (1 - \text{Composite Termination Probability}) / (1 - \text{Expected Mortality Probability})$$

#### ***Other Payment Options Voluntary Lapse***

The smoothed lapse probabilities for other premium payment options (i.e., limited and discounted renewal premium payment options) are a scalar of the lifetime-pay lapse probabilities shown in Exhibit A-2a.

For the 10-pay option, the scalars were developed from a comparison of the lifetime-pay derived lapse probabilities to the 10-pay derived lapse probabilities based on MassMutual experience. Exhibit A-2b provides similar information as Exhibit A-2a, but for policies with a 10-year premium payment period.

For the 20-pay, paid-up at age 65, and discounted renewal payment options, termination experience was of limited credibility. As such, scalars based on actuarial judgment were developed for these options to apply to the lifetime-pay lapse rates. These options are immaterial to the projections for this block of business as they account for <5% of the in-force distribution of business as of December 31, 2019.

The relationships for each payment option were used to develop the smoothed lapse assumptions for the 10-pay, 20-pay, paid-up at age 65, and discounted renewal options detailed in Section 6 of the actuarial memorandum. For insureds with a limited payment duration and the discounted renewal payment option, both scalars are applied to the base lifetime-pay lapse rate.

#### ***Benefit Expiry***

Benefit expiry probabilities reflect assumed policy lapses due to exhaustion of benefits based on the 2014 *Guidelines* and vary by attained age, gender, and benefit period. Policies with lifetime benefits do not have an expiry assumption (i.e., rate of 0%).

#### ***Morbidity***

The morbidity assumption uses claim costs from the 2014 *Guidelines* with experience-adjustment factors based on MassMutual experience. To develop the experience-adjustment factors, we used predictive analytics as described in the Predictive Analytics section below.

Exhibit A-3 supports the morbidity assumption and provides the adjustment factors as well as an A:E exhibit for the key experience buckets used in the development of the factors:

- Exhibit A-3a – Provides the adjustment factors that are to be applied to the 2014 *Guidelines* claim costs.
- Exhibit A-3b
  - Exposure [A] reflects the length of time a covered life is in force (i.e., an exact exposure basis).
  - Actual incurred claim counts [B] and dollars [C] are based on historical claim experience from inception

## Appendix A

### Development and Justification of Current Assumptions

through 2016, with runout through 2017. Actual incurred claim dollars were valued as paid claims plus claim reserves. Paid claims and claim reserves were discounted to the year of incurral.

- 2014 *Guidelines* expected incurred claims [D] are valued as the 2014 *Guidelines* claim costs multiplied by actual all-lives exposure. The claim costs vary by gender, attained age, policy duration, benefit period, elimination period, payment type, level of home care coverage, inflation type, and coverage type (comprehensive/facility only). Policy design, claims adjudication, and degree of underwriting were considered in developing the claim costs.
- Adjusted expected incurred claims [E] are calculated by applying each applicable adjustment from Exhibit A-3a to the 2014 *Guidelines* expected incurred claims [D].
- A:E ratios are calculated as actual incurred claims to the 2014 *Guidelines* expected incurred claims [F] and adjusted expected incurred claims [G]. The adjusted A:E [G] provides an indication of fit. This fit will not be perfect (i.e., ratio deviates from 1.0) because the main goal is to develop an assumption that generalizes well to new data by balancing assumption complexity and fit on the historical experience.

#### **Current Assumption Performance**

Consideration was given to whether adjustments were needed to the current morbidity and persistency assumptions given the additional years of experience that have become available in the time since the assumptions were developed. Exhibit A-4 provides support for the continued use of these assumptions by providing the following information:

- Exhibit A-4a – Provides morbidity and persistency assumption A:E ratios by rate series using experience through 2016 and experience through 2019 with runout through 2020.
- Exhibit A-4b – Provides morbidity and persistency assumption A:E ratios by calendar year using experience through 2019 with runout through 2020.

#### **Improvement**

For projected mortality improvement, the G2 improvement scale from the 2012IAM mortality table was used. This assumption was also used for projected morbidity improvement. The G2 improvement scale varies by attained age and is applied beginning in the first projection year and continues for 10 projection years.

#### **Rate Increase Dependent Assumptions**

At the time of a rate increase, insureds have options to elect a contingent benefit upon lapse (CBUL) or reduced benefit options (RBO). Adverse selection is assumed relative to CBUL and RBO elections. These insured behavior assumptions are provided below and were developed primarily based on actuarial judgment with high-level consideration for the experience of other carriers in the LTC industry, to the extent available.

##### **Contingent Benefit Upon Lapse Election Rates**

A CBUL election rate is determined as a function of the magnitude of the rate increase. The assumption is applied on a seriatim basis based on the cumulative increase as shown in the following table. The total CBUL election rate is then prorated between the prior approved increase and the requested increase.

Cumulative Rate Increase	CBUL
0-14%	0.0%
15-100%	1.6-8.0% <sup>[1]</sup>
>100%	10.0%

<sup>[1]</sup> CBUL election rate is determined as 0.08 multiplied by the rounded rate increase (rounded to nearest 10%).

No CBUL elections are assumed for insureds with a limited premium payment option.

##### **Reduced Benefit Options**

The RBO election rate is based on the CBUL election rate. The RBO election rate is assumed to be two and a half times the CBUL election rate (i.e., 2.5 multiplied by CBUL election) for cumulative rate increases greater than 15%.

## Appendix A

### Development and Justification of Current Assumptions

Because the RBO election rate is based on the CBUL election rate; no RBO is assumed for cumulative increases less than or equal to 15% or for insureds with a limited premium payment option.

Based on the RBO election function, the reduction to premium and claims can then be determined as follows:

Reduction to premium and claims due to the election of RBO  
=  $1 - (\text{Average premium level after the cumulative rate increase with RBO election} / \text{Premium level after the full cumulative rate increase without any RBO election})$ , where

Average premium level after the cumulative rate increase with RBO election  
= weighted average premium level of the assumed percentage of insureds electing RBO with the percentage assumed to accept the full cumulative rate increase

#### *Adverse Selection*

The adverse selection assumption is a function of the CBUL and RBO election rates, such that the relative increase to morbidity due to adverse selection varies by the cumulative rate increase's magnitude. The percentage increase in morbidity due to adverse selection was developed from the following formula and actuarial judgment. We assume that at the time of the rate increase, insureds that elect a CBUL will be selective in that their relative morbidity is 25% lower than that of the remaining pool. Similarly, we assume that at the time of the rate increase, insureds that elect an RBO will be selective in that their relative morbidity is 12.5% lower than that of the remaining pool.

$\text{PoolMorb} = \text{AdvSelMorb} \times (1 - \text{CBUL} - \text{RBO}) + [(1 - 25\%) \times \text{AdvSelMorb}] \times \text{CBUL} + [(1 - 12.5\%) \times \text{AdvSelMorb}] \times \text{RBO}$ , where

PoolMorb =	morbidity of the pool before the rate increase = 1.0
AdvSelMorb =	adverse morbidity of the remaining pool after the rate increase due to selective lapses
CBUL =	percentage of policies that elect CBUL
RBO =	percentage of policies that elect RBO

Solving the above for the adverse selection component results in the following formula:

$\text{Adverse Selection} = 1 / (1 - 25\% \times \text{CBUL} - 12.5\% \times \text{RBO})$

#### *Predictive Analytics*

In developing the mortality and morbidity adjustment factors, predictive analytics was employed in the form of a penalized generalized linear model (GLM).

A penalized GLM is similar to a traditional GLM. The only difference is that it adds an additional constraint that penalizes the size of the model's coefficients in order to control overfitting the model to the historical data. This penalty placed on the coefficients can be seen as a credibility lever, which controls how much weight is given to the company's actual experience. A high penalty would give no weight to the data, leaving the benchmark assumption (i.e., the 2012IAM for mortality or the 2014 *Guidelines* for morbidity) unadjusted. No penalty would give full weight to the company's actual data potentially making large adjustments to the benchmark, which could be overfitting the actual experience. When using a penalized GLM it is important to choose a penalty that gives the right amount of weight to the actual data to avoid underfitting or overfitting the experience.

A standard approach for choosing such a penalty is to use a k-fold cross-validation to test a series of penalty values. A k-fold cross-validation splits the data into k subsets and iteratively trains and tests the model independently on each subset of the data. This process gives an estimation of how well a model will generalize to new data that was not used to develop the assumption. Through the k-fold cross-validation we evaluated the impact the penalty had on the model's generalizability by testing a range of 100 penalties. We selected the penalty that minimized the k-fold cross-validation prediction error. Using this approach, we were able to determine the amount of weight to give actual experience versus the benchmark assumption through a statistically robust and automated process.

## **Appendix A**

### **Development and Justification of Current Assumptions**

#### ***Credibility***

Traditional techniques were employed to develop the voluntarily lapse assumption, which considers actual historical experience, its associated credibility, and actuarial judgment. The credibility percentage was determined as  $(\text{Number of Events} / \text{Credibility Threshold})^{1/2}$ , where an event is defined as an actual voluntary lapse. A credibility standard of a 90% confidence interval for the number of events with an error of plus or minus 7.5% was chosen. Based on these parameters, 481 events is the criterion for full credibility.

**Exhibit A-1a**  
**Mortality Hazard Rate Adjustment Factors**

Attained Age	Factor
<55	0.99
55	0.97
56	0.94
57	0.91
58	0.88
59	0.85
60	0.82
61	0.79
62	0.77
63	0.74
64	0.72
65	0.71
66	0.71
67	0.73
68	0.74
69	0.76
70	0.78
71	0.80
72	0.82
73	0.83
74	0.85
75	0.87
76	0.89
77	0.90
78	0.90
79	0.90
80	0.91
81	0.92
82	0.94
83	0.95
84	0.96
85	0.96
86	0.97
87	0.98
88	0.99
89	0.99
90	1.00
91	1.00
92	1.00
93	1.00
94	1.00
95	1.00
96	1.00
97	1.00
98	1.00
99	1.00
100+	1.00

Gender	Factor
Male	0.98
Female	0.96

Partner Status	Factor
Single	0.99
Partnered	0.95

Underwriting Class	Factor
Preferred	0.94
Standard	0.99
Substandard	1.01

Duration	Factor
1	0.82
2	0.71
3	0.64
4	0.59
5	0.56
6	0.64
7	0.72
8	0.77
9	0.79
10	0.81
11	0.83
12	0.85
13	0.87
14	0.89
15	0.91
16	0.93
17	0.95
18	0.97
19	0.98
20+	0.98

**Exhibit A-1b**  
**Actual-to-Expected (A:E) Mortality Experience through December 31, 2016**  
**All Rate Series Combined**

Policy or Policyowner Characteristic	Policy Year Exposure [A]	Actual		Expected Mortality Probability		Actual-to-Expected Mortality	
		Deaths [B]	Probability [C]	2012IAM [D]	Adjusted [E]	2012IAM [F] = [C] / [D]	Adjusted [G] = [C] / [E]
Partner Status							
Partnered	633,561	1,725	0.3%	0.7%	0.4%	0.41	0.77
Single	227,515	974	0.4%	0.8%	0.5%	0.53	0.91
Gender							
Female	481,531	1,253	0.3%	0.6%	0.3%	0.44	0.79
Male	379,545	1,446	0.4%	0.8%	0.4%	0.46	0.85
Policy Duration							
1-3	283,626	351	0.1%	0.4%	0.2%	0.28	0.52
4-6	226,364	530	0.2%	0.6%	0.3%	0.40	0.93
7-9	171,663	650	0.4%	0.8%	0.4%	0.50	0.91
10-12	125,828	668	0.5%	1.0%	0.6%	0.52	0.86
13+	53,595	500	0.9%	1.5%	1.0%	0.61	0.90
Attained Age							
<65	569,972	776	0.1%	0.4%	0.2%	0.36	0.68
65-69	165,496	562	0.3%	0.9%	0.4%	0.38	0.79
70-74	83,040	591	0.7%	1.3%	0.7%	0.53	0.95
75-79	30,756	399	1.3%	2.2%	1.4%	0.59	0.93
80-84	9,331	229	2.4%	3.9%	2.7%	0.63	0.91
85+	2,481	142	5.6%	7.7%	5.8%	0.73	0.97
Underwriting							
Preferred	536,646	1,597	0.3%	0.7%	0.4%	0.42	0.77
Standard	275,333	848	0.3%	0.7%	0.4%	0.45	0.81
Substandard	49,096	254	0.5%	0.7%	0.4%	0.76	1.34
Rate Series							
200 Series	316,341	1,493	0.5%	0.9%	0.5%	0.54	0.94
300 Series	229,396	643	0.3%	0.6%	0.4%	0.43	0.79
400 Series	152,091	340	0.2%	0.6%	0.3%	0.38	0.74
500+ Series	163,247	223	0.1%	0.5%	0.3%	0.26	0.52
Total	861,076	2,699	0.3%	0.7%	0.4%	0.45	0.82

**Exhibit A-2a(i)**  
**Derived Lifetime-Pay Voluntary Lapse Experience through December 31, 2016**  
**Single Policies for All Rate Series Combined**

Duration	Exposure	Composite Termination Probability	Expected Mortality Probability	Derived Lapse Probability	Credibility Percent	Smoothed Lapse Probability
1	23,407	4.2%	0.3%	4.0%	100%	4.00%
2	21,264	5.8%	0.3%	5.5%	100%	5.50%
3	19,703	3.8%	0.3%	3.6%	100%	3.50%
4	18,369	3.3%	0.3%	3.0%	100%	3.00%
5	17,007	2.8%	0.3%	2.5%	93%	2.50%
6	15,568	2.3%	0.4%	1.9%	79%	2.00%
7	14,443	2.2%	0.5%	1.7%	73%	1.75%
8	13,494	1.9%	0.5%	1.4%	62%	1.25%
9	12,543	1.9%	0.6%	1.3%	59%	0.90%
10	11,331	1.7%	0.7%	0.9%	47%	0.90%
11	10,159	1.4%	0.8%	0.6%	40%	0.90%
12	8,603	1.5%	0.9%	0.6%	34%	0.90%
13	6,007	2.2%	1.1%	1.1%	32%	0.90%
14	3,887	2.1%	1.4%	0.7%	23%	0.90%
15	2,128	2.1%	1.6%	0.5%	14%	0.90%
16	834	2.1%	2.0%	0.1%	10%	0.90%
17	65	0.0%	2.4%	-2.4%	0%	0.90%
1-3	64,374	4.6%	0.3%	4.4%	100%	4.3%
4-6	50,944	2.8%	0.3%	2.5%	100%	2.5%
7+	83,493	1.9%	0.8%	1.1%	100%	1.1%
8+	69,050	1.8%	0.8%	1.0%	100%	1.0%
9+	55,556	1.8%	0.9%	0.9%	100%	0.9%
All	198,811	3.0%	0.5%	2.5%	100%	2.5%



**Exhibit A-2a(ii)**  
**Derived Lifetime-Pay Voluntary Lapse Experience through December 31, 2016**  
**Partnered Policies for All Rate Series Combined**

Duration	Exposure	Composite Termination Probability	Expected Mortality Probability	Derived Lapse Probability	Credibility Percent	Smoothed Lapse Probability
1	63,015	1.7%	0.3%	1.5%	100%	1.50%
2	58,226	2.8%	0.2%	2.6%	100%	2.50%
3	54,233	2.2%	0.2%	1.9%	100%	2.00%
4	50,328	1.7%	0.2%	1.4%	100%	1.50%
5	45,537	1.4%	0.2%	1.2%	100%	1.20%
6	39,531	1.2%	0.3%	0.9%	86%	0.90%
7	35,798	1.1%	0.4%	0.7%	77%	0.70%
8	32,859	1.0%	0.4%	0.6%	68%	0.60%
9	30,266	1.0%	0.5%	0.5%	58%	0.50%
10	27,255	0.9%	0.5%	0.4%	53%	0.50%
11	24,529	1.1%	0.6%	0.5%	50%	0.50%
12	20,834	1.0%	0.7%	0.3%	42%	0.50%
13	15,039	1.0%	0.8%	0.1%	33%	0.50%
14	10,352	1.4%	1.0%	0.5%	33%	0.50%
15	5,487	1.4%	1.2%	0.1%	18%	0.50%
16	2,042	1.1%	1.5%	-0.5%	9%	0.50%
17	138	0.7%	1.9%	-1.2%	0%	0.50%
1-3	175,475	2.2%	0.2%	2.0%	100%	2.0%
4-6	135,396	1.4%	0.3%	1.2%	100%	1.2%
7+	204,599	1.0%	0.6%	0.5%	100%	0.6%
8+	168,800	1.0%	0.6%	0.4%	100%	0.5%
9+	135,942	1.0%	0.7%	0.4%	100%	0.5%
All	515,469	1.6%	0.4%	1.2%	100%	1.2%

**Exhibit A-2b(i)**  
**Derived 10-Pay Voluntary Lapse Experience through December 31, 2016**  
**Single Policies for All Rate Series Combined**

Duration	Exposure	Composite Termination Probability	Expected Mortality Probability	Derived Lapse Probability	Credibility Percent	Ratio to Lifetime-Pay Lapse <sup>[1]</sup>	Smoothed Ratio to Lifetime-Pay <sup>[2]</sup>	Smoothed Lapse Probability
1	1,950	1.8%	0.2%	1.6%	27%	0.41	0.50	2.00%
2	1,884	3.9%	0.2%	3.7%	38%	0.68	0.50	2.75%
3	1,820	2.4%	0.2%	2.3%	30%	0.64	0.50	1.75%
4	1,793	1.7%	0.2%	1.5%	24%	0.51	0.50	1.50%
5	1,733	1.6%	0.2%	1.4%	24%	0.57	0.50	1.25%
6	1,587	0.8%	0.2%	0.6%	14%	0.31	0.50	1.00%
7	1,499	1.1%	0.3%	0.8%	16%	0.45	0.50	0.88%
8	1,442	0.4%	0.3%	0.1%	9%	0.07	0.50	0.63%
9	1,371	0.4%	0.4%	0.1%	8%	0.06	0.00	0.00%
10	1,251	0.2%	0.4%	-0.2%	0%	-0.17	0.00	0.00%
11	1,103	0.2%	0.5%	-0.3%	0%	-0.46	0.00	0.00%
12	902	0.2%	0.5%	-0.3%	0%	-0.51	0.00	0.00%
13	502	0.4%	0.6%	-0.2%	0%	-0.17	0.00	0.00%
14	282	0.7%	0.7%	0.0%	0%	-0.01	0.00	0.00%
15	143	0.7%	0.9%	-0.2%	0%	-0.42	0.00	0.00%
16	52	0.0%	1.0%	-1.0%	0%	-7.48	0.00	0.00%
17	3	0.0%	0.8%	-0.8%	0%	0.33	0.00	0.00%
All	19,318	1.4%	0.3%	1.1%	69%	0.43	0.43	1.1%

[1] Values in this column are calculated as the ratio of the 10-pay derived lapse probability to the corresponding lifetime-pay derived lapse probability from Exhibit A-2a (e.g., Duration 3 ratio = 2.3% / 3.6%).

[2] Values in this column are calculated as the ratio of the 10-pay smoothed lapse probability to the corresponding lifetime-pay smoothed lapse probability from Exhibit A-2a (e.g., Duration 3 ratio = 1.75% / 3.50%).

**Exhibit A-2b(ii)**  
**Derived 10-Pay Voluntary Lapse Experience through December 31, 2016**  
**Partnered Policies for All Rate Series Combined**

Duration	Exposure	Composite Termination Probability	Expected Mortality Probability	Derived Lapse Probability	Credibility Percent	Ratio to Lifetime-Pay Lapse <sup>[1]</sup>	Smoothed Ratio to Lifetime-Pay <sup>[2]</sup>	Smoothed Lapse Probability
1	8,646	0.7%	0.2%	0.5%	35%	0.35	0.50	0.75%
2	8,528	1.4%	0.2%	1.2%	48%	0.46	0.50	1.25%
3	8,431	1.3%	0.2%	1.1%	46%	0.59	0.50	1.00%
4	8,325	1.1%	0.2%	0.9%	41%	0.65	0.50	0.75%
5	7,960	1.2%	0.2%	1.0%	42%	0.89	0.50	0.60%
6	6,899	0.5%	0.2%	0.3%	25%	0.39	0.50	0.45%
7	6,371	0.9%	0.2%	0.6%	28%	0.90	0.50	0.35%
8	6,009	0.4%	0.3%	0.2%	14%	0.27	0.50	0.30%
9	5,560	0.4%	0.3%	0.1%	11%	0.18	0.00	0.00%
10	4,936	0.5%	0.3%	0.2%	19%	0.44	0.00	0.00%
11	4,360	0.4%	0.4%	0.0%	14%	0.02	0.00	0.00%
12	3,477	0.4%	0.4%	0.0%	6%	-0.09	0.00	0.00%
13	1,986	0.4%	0.5%	-0.2%	0%	-1.09	0.00	0.00%
14	1,158	0.6%	0.6%	0.0%	0%	0.00	0.00	0.00%
15	599	0.7%	0.7%	0.0%	0%	-0.20	0.00	0.00%
16	216	0.5%	0.8%	-0.3%	0%	0.72	0.00	0.00%
17	11	0.0%	1.0%	-1.0%	0%	0.83	0.00	0.00%
All	83,473	0.8%	0.2%	0.6%	100%	0.50	0.43	0.5%

[1] Values in this column are calculated as the ratio of the 10-pay derived lapse probability to the corresponding lifetime-pay derived lapse probability from Exhibit A-2a (e.g., Duration 3 ratio = 1.1% / 1.9%).

[2] Values in this column are calculated as the ratio of the 10-pay smoothed lapse probability to the corresponding lifetime-pay smoothed lapse probability from Exhibit A-2a (e.g., Duration 3 ratio = 1.00% / 2.00%).

**Exhibit A-3a**  
**Morbidity Adjustment Factors**

Duration	Rate Series			
	200 Series	300 Series	400 Series	500+ Series
1	0.99	1.05	1.02	1.00
2	1.01	1.12	1.05	0.99
3	1.02	1.11	1.05	0.97
4	1.08	1.03	0.99	0.96
5	1.05	0.96	0.95	0.96
6	1.10	0.99	0.92	0.98
7	1.05	1.01	0.95	0.98
8	1.10	1.03	0.94	0.98
9	1.09	1.02	0.93	0.97
10	1.14	1.02	0.90	0.99
11	1.08	0.96	0.91	1.00
12	1.05	0.92	0.93	1.00
13	0.99	0.90	0.97	1.00
14	0.99	0.95	0.99	1.00
15	0.96	0.98	1.00	1.00
16	0.97	1.00	1.00	1.00
17	0.97	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00
19	1.00	1.00	1.00	1.00
20+	1.00	1.00	1.00	1.00

Gender	Factor
Male	1.04
Female	0.91

Underwriting Class	Factor
Preferred	0.90
Non-Preferred	1.05

Attained Age	Rate Series				Benefit Period		Benefit Type	
	200 Series	300 Series	400 Series	500+ Series	Lifetime	Non-Lifetime	Indemnity	Reimbursement
<55	1.02	1.00	1.00	1.00	1.02	1.00	1.03	0.99
55	1.02	1.00	1.00	1.00	1.02	1.00	1.03	0.99
56	1.02	1.00	1.00	1.00	1.02	1.00	1.03	0.99
57	1.02	1.00	0.97	0.99	0.99	0.99	1.01	0.97
58	1.00	0.98	0.94	0.99	0.94	0.97	0.99	0.93
59	0.98	0.98	0.93	0.98	0.92	0.95	0.96	0.91
60	0.93	0.97	0.91	0.98	0.88	0.92	0.91	0.89
61	0.93	0.96	0.88	0.98	0.87	0.90	0.89	0.88
62	0.92	0.95	0.88	0.99	0.86	0.89	0.86	0.89
63	0.93	0.95	0.90	1.00	0.89	0.89	0.85	0.93
64	0.96	0.93	0.90	1.00	0.91	0.88	0.86	0.94
65	1.00	0.91	0.91	1.01	0.92	0.91	0.89	0.94
66	0.99	0.91	0.93	1.00	0.93	0.91	0.92	0.92
67	1.00	0.92	0.96	1.00	0.96	0.92	0.96	0.92
68	1.01	0.96	0.96	0.99	0.99	0.93	1.03	0.90
69	0.99	0.98	0.95	0.99	0.97	0.95	1.05	0.87
70	0.97	1.01	0.97	0.98	0.99	0.93	1.04	0.89
71	0.97	1.02	0.96	0.98	1.02	0.93	1.05	0.90
72	1.00	1.05	0.95	0.98	1.06	0.92	1.09	0.90
73	0.99	1.03	0.97	0.99	1.06	0.91	1.07	0.91
74	1.01	1.03	1.00	0.99	1.13	0.91	1.07	0.96
75	1.05	1.01	1.00	0.99	1.15	0.92	1.07	0.98
76	1.07	0.99	1.01	0.99	1.13	0.93	1.06	1.00
77	1.06	0.96	1.02	1.00	1.10	0.95	1.03	1.01
78	1.10	0.96	1.00	1.00	1.10	0.97	1.02	1.03
79	1.10	0.96	0.99	0.99	1.05	0.98	1.02	1.02
80	1.09	0.97	0.98	0.99	1.03	1.00	1.03	1.00
81	1.10	0.99	0.97	0.99	1.04	1.01	1.04	1.01
82	1.10	1.00	0.97	0.99	1.03	1.03	1.05	1.01
83	1.07	1.01	0.97	0.99	1.02	1.02	1.05	1.00
84	1.06	1.02	0.97	0.99	1.02	1.02	1.03	1.01
85	1.04	1.02	0.98	0.99	1.01	1.01	1.02	1.00
86	1.02	1.01	0.98	0.99	1.00	1.00	1.01	1.00
87	1.00	1.01	0.99	0.99	0.99	1.00	1.00	0.99
88	0.99	1.01	0.99	1.00	0.99	1.00	0.99	1.00
89	0.98	1.00	1.00	1.00	0.98	1.00	0.99	0.99
90	0.99	1.00	1.01	1.00	0.98	1.02	0.99	1.00
91	0.99	1.00	1.01	1.00	0.98	1.02	0.99	1.00
92	1.00	0.99	1.01	1.00	0.98	1.02	0.99	1.01
93	1.00	1.00	1.01	1.00	0.98	1.02	0.99	1.01
94	1.01	1.00	1.01	1.00	0.99	1.02	1.00	1.01
95	1.01	1.00	1.00	1.00	0.99	1.02	1.00	1.01
96	1.01	1.00	1.00	1.00	1.00	1.01	1.00	1.01
97	1.01	1.00	1.00	1.00	1.00	1.01	1.00	1.01
98	1.01	1.00	1.00	1.00	1.00	1.01	1.00	1.01
99	1.00	1.00	1.00	1.00	1.00	1.01	1.00	1.01
100+	1.00	1.00	1.00	1.00	1.00	1.01	1.00	1.00

**Exhibit A-3b**  
**Actual-to-Expected (A:E) Morbidity Experience through December 31, 2016 with Claim Runout**  
**All Rate Series Combined**

Policy or Policyowner Characteristic	Exposure [A]	Actual Incurred Claims		Expected Incurred Claims		Actual-to-Expected Incurred Claims	
		Count	Dollars	2014 <i>Guidelines</i>	Adjusted	2014 <i>Guidelines</i>	Adjusted
		[B]	[C]	[D]	[E]	[F] = [C] / [D]	[G] = [C] / [E]
Partner Status							
Partnered	633,635	876	124,048,594	132,133,570	120,544,568	0.94	1.03
Single	227,993	826	121,211,932	134,525,136	124,715,707	0.90	0.97
Gender							
Female	482,025	1,023	154,581,170	177,733,534	159,654,075	0.87	0.97
Male	379,604	679	90,679,357	88,925,171	85,606,200	1.02	1.06
Policy Duration							
1-3	283,773	161	19,695,627	16,903,749	17,393,115	1.17	1.13
4-6	226,507	296	38,343,898	38,042,194	38,289,115	1.01	1.00
7-9	171,790	424	53,999,057	64,223,707	55,942,454	0.84	0.97
10-12	125,922	466	77,447,114	83,788,181	76,093,914	0.92	1.02
13+	53,636	355	55,774,830	63,700,875	57,541,678	0.88	0.97
Attained Age							
<64	569,996	358	49,741,046	57,532,795	49,275,898	0.86	1.01
65-69	165,548	275	47,126,413	55,453,787	46,645,563	0.85	1.01
70-74	83,119	315	51,145,259	59,219,224	54,400,783	0.86	0.94
75-79	30,888	350	53,617,580	49,126,578	50,974,964	1.09	1.05
80-84	9,475	261	30,528,317	30,098,971	30,218,075	1.01	1.01
85+	2,603	143	13,101,912	15,227,350	13,744,992	0.86	0.95
Underwriting							
Preferred	536,926	996	143,125,012	168,434,188	149,574,881	0.85	0.96
Non-Preferred	324,703	706	102,135,515	98,224,517	95,685,395	1.04	1.07
Benefit Type							
Indemnity	261,867	486	89,470,260	83,551,515	76,889,898	1.07	1.16
Reimbursement	599,762	1,216	155,790,266	183,107,190	168,370,377	0.85	0.93
Rate Series							
200 Series	316,802	1,023	144,886,364	142,934,657	136,496,321	1.01	1.06
300 Series	229,457	375	62,282,938	73,190,269	64,361,822	0.85	0.97
400 Series	152,111	204	24,106,166	34,345,895	29,031,345	0.70	0.83
500+ Series	163,258	100	13,985,059	16,187,884	15,370,786	0.86	0.91
Total	861,628	1,702	245,260,527	266,658,705	245,260,275	0.92	1.00

**Exhibit A-4a**  
**Comparison of Actual-to-Expected (A:E) Experience through December 31, 2016 and December 31, 2019**

Rate Series	Actual-to-Expected Morbidity		Actual-to-Expected Total Terminations		Actual-to-Expected Mortality		Actual-to-Expected Lapse	
	2016 Data	2019 Data	2016 Data	2019 Data	2016 Data	2019 Data	2016 Data	2019 Data
200 Series	1.06	1.07	0.95	0.95	0.94	0.98	0.95	0.93
300 Series	0.97	1.04	0.89	0.88	0.79	0.84	0.92	0.90
400 Series	0.83	0.79	1.17	1.13	0.74	0.76	1.26	1.24
500+ Series	0.91	0.78	0.97	0.97	0.52	0.56	1.03	1.04
Total	1.00	1.00	0.98	0.97	0.82	0.85	1.02	1.01

**Exhibit A-4b**  
**Calendar Year Actual-to-Expected (A:E) Experience through December 31, 2019**  
**All Rate Series Combined**

CY	Morbidity	Total Terminations	Mortality	Lapse
2000	0.00	0.91	0.87	0.92
2001	0.31	1.56	0.42	1.71
2002	0.87	1.21	0.83	1.25
2003	1.36	1.14	0.87	1.17
2004	0.66	0.95	0.94	0.95
2005	1.72	0.85	0.69	0.86
2006	0.73	0.83	0.78	0.83
2007	1.29	0.93	0.93	0.93
2008	1.00	1.09	0.97	1.11
2009	1.28	1.45	0.97	1.54
2010	1.26	1.13	0.83	1.21
2011	1.02	0.99	0.81	1.05
2012	0.99	0.94	0.78	0.99
2013	0.89	0.89	0.85	0.90
2014	1.12	0.91	0.85	0.94
2015	1.18	0.87	0.89	0.85
2016	0.89	0.95	0.91	0.96
2017	1.06	0.89	0.81	0.95
2018	0.89	0.90	0.81	0.97
2019	0.90	0.88	0.83	0.93
Total	1.00	0.97	0.85	1.01

**MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY**

**Address:** 1295 State Street, Springfield, MA 01111

**Supplement to the Actuarial Memorandum**

**November 30, 2021**

<u>Product</u>	<u>Number</u>
200 Series	
Tax-Qualified Comprehensive Long-Term Care Policy Form	MM-200-P-PA et al.
Tax-Qualified Nursing Facility Only Long-Term Care Policy Form	MM-201-P-PA et al.
Tax-Qualified Franchise Comprehensive Long-Term Care Policy Form	MM-202-P-PA et al.
Tax-Qualified Franchise Nursing Facility Only Long-Term Care Policy Form	MM-203-P-PA et al.
Tax-Qualified Comprehensive Long-Term Care Policy Form	MM-200-P-1-PA et al.
Tax-Qualified Nursing Facility Only Long-Term Care Policy Form	MM-201-P-1-PA et al.
Tax-Qualified Franchise Comprehensive Long-Term Care Policy Form	MM-202-P-1-PA et al.
Tax-Qualified Franchise Nursing Facility Only Long-Term Care Policy Form	MM-203-P-1-PA et al.
400 Series	
Tax-Qualified Comprehensive Long-Term Care Policy Form	MM-400-P-PA et al.
Tax-Qualified Nursing Facility Only Long-Term Care Policy Form	MM-401-P-PA et al.
Tax-Qualified Franchise-Association Discount Comprehensive Long-Term Care Policy Form	MM-402-P-PA et al.
Tax-Qualified Franchise-Association Discount Nursing Facility Only Long-Term Care Policy Form	MM-403-P-PA et al.
Tax-Qualified Franchise-Employer Discount Comprehensive Long-Term Care Policy Form	MM-404-P-PA et al.
Tax-Qualified Franchise-Employer Discount Nursing Facility Only Long-Term Care Policy Form	MM-405-P-PA et al.
500 Series	
Tax-Qualified Comprehensive Long-Term Care Policy Form	MM500-P-PA et al.
Tax-Qualified Franchise Comprehensive Long-Term Care Policy Form	MM502-P-PA et al.
511 Series	
Tax-Qualified Comprehensive Long-Term Care Policy Form	MM500-P-1-PA et al.
Tax-Qualified Franchise Comprehensive Long-Term Care Policy Form	MM502-P-1-PA et al.

**1. Purpose of Filing**

This supplement has been prepared for the purpose of demonstrating that the requested rate increase complies with Chapter 18 Section 3803(c) and Reg. 89.83 of the Insurance Regulations for the state of Pennsylvania. It may not be appropriate for other purposes.

The experience provided in this supplement reflects the pooled experience of the policy forms listed above as well as the nationwide experience across the five rate series. Section 15 of the enclosed actuarial memorandum provides a description as to the appropriateness of pooling the experience of these policy forms.

**2. Demonstration of Compliance with Chapter 18 Section 3803**

(c): We believe that we comply with this subsection of the regulation by submitting these rates before they are being used.

**3. Demonstration of Compliance with Reg. 89.83**

89.83 (a): This subsection requires no action.

89.83 (b): This subsection is not applicable since this filing is not for rates for a new policy form.

89.83 (c): *Revision of Current Rates*

(1): For policies issued prior to September 16, 2002, the effective date of rate stability in Pennsylvania, the minimum loss ratio requirement is 60%, as specified in Reg. 89a.117.(b). For policies issued on or after September 16, 2002, the loss ratio requirements are specified in Reg. 89a.118.(c)(2), (i.e., the 58%/85% test). Demonstration of satisfaction of these requirements is discussed in Section 15 of the enclosed actuarial memorandum.

**MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY**

**Address:** 1295 State Street, Springfield, MA 01111

**Supplement to the Actuarial Memorandum**

**November 30, 2021**

As of year-end 2019, 3,901 of the 4,964 policies that are in force and subject to the requested rate increase in Pennsylvania were issued on or after September 16, 2002 (approximately 79%). However, because the company manages this block of business as a whole, this rate increase filing complies with both sets of requirements for all of the policies, regardless of issue date.

(2): Section 3 of the actuarial memorandum provides a description of benefits. Copies of the affected policy forms may be provided upon request.

(2)(i): The primary reason why these forms are in need of a premium rate increase is due to emerging experience running more adversely than expected in pricing.

The company is requesting a premium rate increase as described in Section 2 of the enclosed actuarial memorandum. The table in Section 2 provides the distribution, range, and average requested rate increases for each series based on the nationwide distribution of business. The enclosed cover letter provides similar information based on a Pennsylvania-specific distribution.

The current rate schedules along with the proposed rate schedules are enclosed with this filing. Please note that the actual rates implemented may vary slightly from those shown due to rounding algorithms.

Attachment 1 to this supplement provides actual and projected nationwide experience using current assumptions, as described in Section 6 of the actuarial memorandum. Included are calendar year earned premiums, incurred claims, annual loss ratios, end of year lives, and cumulative loss ratios with interest. Attachment 1 provides information similar to Exhibit I of the actuarial memorandum.

Attachment 2 to this supplement provides nationwide experience showing written premium, paid claims, annual loss ratios and cumulative loss ratios. Values in Attachments 1 and 2 are shown both before and after the requested rate increase. The interest rate used in Attachments 1 and 2 to accumulate and discount values is the maximum valuation interest rate for contract reserves applicable for the year of issue (which ranges from 3.5% to 4.5%, and averages to 4.1%).

Attachments 3 and 4 to this supplement provide information similar to Attachments 1 and 2, respectively, for Pennsylvania-specific experience. Please note that Pennsylvania-specific experience is not considered fully credible, but is being provided as required.

(2)(ii)(A): One prior rate increase has been implemented on these policy forms. In December 2018, the Department allowed the company to implement a maximum 52.1% increase, where rate increases greater than 15.0% were spread over a period of two to three years, that was then capped at the 513 Series rates. This resulted in a prior rate increase that ranged from 0% to 52.1% and averaged 47.3%. The resulting average dollar increase of annualized premiums for Pennsylvania policies was \$852.

(2)(ii)(B): Expenses have not been reflected in the projections for this filing. Attachment 5 provides a description of the expense assumptions, including commission scales for the products in this filing. The expense and commission assumptions are consistent with pricing assumptions.

(2)(ii)(C)(I): Premiums earned and written since inception for nationwide experience can be found in Attachments 1 and 2, respectively. Premiums earned and written since inception for Pennsylvania-specific experience can be found in Attachments 3 and 4, respectively. Attachment 6 to this supplement provides reserve balances and the calculation basis for both nationwide and Pennsylvania-specific experience. Please note that Pennsylvania-specific experience is not considered fully credible, but is being provided as required.

(2)(ii)(C)(II): Attachment 6 to this supplement provides a breakdown of historical incurred claims and active life reserve balance, including a description of the calculation basis, for both nationwide and Pennsylvania-specific experience. Please note that Pennsylvania-specific experience is not considered fully credible, but is being provided as required.

Attachment 7 to this supplement provides actual and projected experience on a durational basis using current assumptions. Included are policy year earned premiums, incurred claims, durational loss ratios, end of year lives, and cumulative loss ratios with interest. Values in Attachment 7 are shown both before and after the requested



**MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY**

**Address:** 1295 State Street, Springfield, MA 01111

**Supplement to the Actuarial Memorandum**

**November 30, 2021**

rate increase. The number of durations shown was chosen to capture the majority of the durations underlying Attachment 1. Similar to Attachments 1 through 4, the values used to calculate the cumulative loss ratios are accumulated and discounted at the maximum valuation interest rate.

Attachment 8 to this supplement provides information similar to Attachment 7 for Pennsylvania-specific experience. Please note that Pennsylvania-specific experience is not considered fully credible, but is being provided as required.

(2)(ii)(D): We believe that we have provided information sufficient to support the rate increase requested in this filing.

(2)(iii): We understand that data used in this rate increase filing is in agreement with those used in the annual statement filed with the Department.

89.83 (d): We believe the proposed rate tables provided with this filing comply with this subsection.

**Attachment 1-a**  
**Massachusetts Mutual Life Insurance Company**  
**Earned Premium and Incurred Claim Experience and Projections by Calendar Year**  
**Nationwide Experience Before Requested Rate Increase**  
**All Rate Series Combined**

	Calendar Year	Actual or Projected Experience using Current Assumptions				Cumulative Loss Ratio with interest
		A Earned Premium	B Incurred Claims	C = B / A Incurred Loss Ratio	D End of Year Lives	E Actual (Column C) with Max. Val. Interest
Historical Experience	2000	613,240	0	0%	1,775	0%
	2001	8,383,016	64,652	1%	7,635	1%
	2002	21,390,485	524,902	2%	15,504	2%
	2003	38,387,225	1,705,214	4%	24,542	3%
	2004	58,559,259	1,499,223	3%	34,040	3%
	2005	88,589,065	6,151,316	7%	45,049	5%
	2006	108,269,558	3,965,336	4%	50,038	4%
	2007	121,853,024	9,302,543	8%	54,355	5%
	2008	137,132,224	9,425,421	7%	58,767	6%
	2009	146,737,674	14,920,550	10%	61,207	6%
	2010	156,994,117	18,556,754	12%	64,681	7%
	2011	169,923,956	18,633,752	11%	70,244	8%
	2012	193,185,040	22,275,241	12%	77,290	8%
	2013	201,090,592	24,296,952	12%	79,378	9%
	2014	196,050,128	35,607,782	18%	78,504	10%
	2015	183,683,441	44,629,852	24%	77,731	11%
	2016	174,815,054	39,553,195	23%	76,871	12%
	2017	167,930,921	55,868,775	33%	76,099	13%
	2018	160,748,844	57,100,691	36%	75,145	14%
	2019	156,587,832	69,990,110	45%	73,816	16%
Projected Future Experience	2020	162,066,714	88,198,984	54%	72,195	17%
	2021	163,438,416	101,510,557	62%	70,049	19%
	2022	166,168,627	115,016,805	69%	68,275	21%
	2023	170,256,373	132,164,020	78%	66,994	23%
	2024	169,358,513	151,611,450	90%	65,656	25%
	2025	165,927,930	173,299,070	104%	64,246	28%
	2026	161,738,223	197,139,301	122%	62,763	30%
	2027	157,308,598	223,440,483	142%	61,202	33%
	2028	152,695,587	252,334,549	165%	59,561	36%
	2029	147,971,832	283,693,328	192%	57,837	39%
	2030	143,162,180	318,893,800	223%	56,022	43%
	2031	138,116,461	357,946,570	259%	54,108	46%
	2032	132,806,917	398,443,510	300%	52,097	50%
	2033	127,311,303	440,111,576	346%	49,993	54%
	2034	121,588,777	482,358,264	397%	47,800	59%
	2035	115,648,415	523,798,350	453%	45,526	63%
	2036	109,500,603	563,379,499	514%	43,180	68%
	2037	103,232,287	600,324,985	582%	40,774	72%
	2038	96,845,094	633,770,657	654%	38,323	77%
	2039	90,374,141	662,498,111	733%	35,844	82%
	2040	83,875,173	685,160,120	817%	33,354	87%
	2041	77,390,818	701,332,773	906%	30,872	91%
	2042	70,981,378	710,856,002	1,001%	28,418	96%
	2043	64,702,197	713,479,784	1,103%	26,010	100%
	2044	58,602,679	709,249,287	1,210%	23,667	104%
	2045	52,732,282	698,344,503	1,324%	21,408	108%
	2046	47,135,079	681,136,057	1,445%	19,248	112%
	2047	41,848,950	658,204,646	1,573%	17,200	116%
	2048	36,903,536	629,899,485	1,707%	15,275	119%
	2049	32,320,407	597,375,105	1,848%	13,482	122%
	2050	28,113,192	561,360,148	1,997%	11,827	124%
	2051	24,287,015	523,101,551	2,154%	10,311	127%
	2052	20,837,647	483,427,653	2,320%	8,934	129%
	2053	17,756,143	443,145,060	2,496%	7,695	131%
	2054	15,028,957	403,096,630	2,682%	6,589	132%
	2055-2059	45,066,260	1,458,502,425	3,236%	20,494	138%
	2060-2064	16,524,317	741,822,488	4,489%	8,136	140%
	2065-2069	5,501,675	325,341,137	5,913%	2,924	141%
	2070-2074	1,718,128	124,424,058	7,242%	979	141%
	2075-2079	496,020	40,283,774	8,121%	311	141%

With Interest Accum./Disc. To 12/31/2019

History	3,471,707,374	539,992,924	16%
Future	2,246,034,333	7,525,163,942	335%
Lifetime	5,717,741,707	8,065,156,866	141%

**Attachment 1-b**  
**Massachusetts Mutual Life Insurance Company**  
**Earned Premium and Incurred Claim Experience and Projections by Calendar Year**  
**Nationwide Experience After Requested Rate Increase**  
**All Rate Series Combined**

	Calendar Year	Actual or Projected Experience using Current Assumptions				Cumulative Loss Ratio with interest
		A Earned Premium	B Incurred Claims	C = B / A Incurred Loss Ratio	D End of Year Lives	E Actual (Column C) with Max. Val. Interest
Historical Experience	2000	613,240	0	0%	1,775	0%
	2001	8,383,016	64,652	1%	7,635	1%
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	2003	38,387,225	1,705,214	4%	24,542	3%
	2004	58,559,259	1,499,223	3%	34,040	3%
	2005	88,589,065	6,151,316	7%	45,049	5%
	2006	108,269,558	3,965,336	4%	50,038	4%
	2007	121,853,024	9,302,543	8%	54,355	5%
	2008	137,132,224	9,425,421	7%	58,767	6%
	2009	146,737,674	14,920,550	10%	61,207	6%
	2010	156,994,117	18,556,754	12%	64,681	7%
	2011	169,923,956	18,633,752	11%	70,244	8%
	2012	193,185,040	22,275,241	12%	77,290	8%
	2013	201,090,592	24,296,952	12%	79,378	9%
	2014	196,050,128	35,607,782	18%	78,504	10%
	2015	183,683,441	44,629,852	24%	77,731	11%
	2016	174,815,054	39,553,195	23%	76,871	12%
	2017	167,930,921	55,868,775	33%	76,099	13%
	2018	160,748,844	57,100,691	36%	75,145	14%
	2019	156,587,832	69,990,110	45%	73,816	16%
Projected Future Experience	2020	162,066,714	88,198,984	54%	72,195	17%
	2021	163,438,416	101,510,557	62%	70,049	19%
	2022	174,896,422	113,240,125	65%	66,884	21%
	2023	198,924,712	124,105,657	62%	64,683	23%
	2024	201,804,803	140,296,851	70%	63,260	24%
	2025	198,851,436	159,358,666	80%	61,792	26%
	2026	194,452,443	180,479,374	93%	60,347	29%
	2027	189,121,201	204,401,519	108%	58,851	31%
	2028	183,549,763	230,735,211	126%	57,279	33%
	2029	177,855,607	259,324,095	146%	55,627	36%
	2030	172,049,995	291,432,663	169%	53,887	39%
	2031	165,955,376	327,079,207	197%	52,053	42%
	2032	159,544,330	364,069,103	228%	50,126	45%
	2033	152,923,680	402,164,628	263%	48,109	49%
	2034	146,036,390	440,845,056	302%	46,007	52%
	2035	138,888,547	478,847,841	345%	43,826	56%
	2036	131,499,197	515,225,524	392%	41,577	60%
	2037	123,961,010	549,264,604	443%	39,269	64%
	2038	116,281,010	580,184,741	499%	36,918	68%
	2039	108,498,878	606,868,512	559%	34,539	72%
	2040	100,688,601	628,086,336	624%	32,149	76%
	2041	92,896,624	643,425,261	693%	29,766	80%
	2042	85,196,938	652,730,385	766%	27,407	84%
	2043	77,655,385	655,752,886	844%	25,094	88%
	2044	70,330,760	652,526,053	928%	22,842	91%
	2045	63,282,109	643,185,625	1,016%	20,669	95%
	2046	56,562,187	628,041,274	1,110%	18,590	98%
	2047	50,216,451	607,584,751	1,210%	16,619	101%
	2048	44,280,324	582,130,773	1,315%	14,765	104%
	2049	38,779,608	552,740,345	1,425%	13,037	106%
	2050	33,730,417	520,062,371	1,542%	11,441	109%
	2051	29,138,874	485,242,598	1,665%	9,979	111%
	2052	25,000,027	449,017,227	1,796%	8,651	112%
	2053	21,302,761	412,140,324	1,935%	7,454	114%
	2054	18,030,902	375,397,081	2,082%	6,385	115%
	2055-2059	54,074,118	1,363,328,535	2,521%	19,885	120%
	2060-2064	19,838,885	697,836,780	3,518%	7,910	122%
	2065-2069	6,615,580	307,705,781	4,651%	2,847	123%
	2070-2074	2,071,512	118,176,811	5,705%	955	123%
	2075-2079	599,737	38,369,390	6,398%	304	123%

With Interest Accum./Disc. To 12/31/2019

History	3,471,707,374	539,992,924	16%
Future	2,606,684,661	6,949,065,250	267%
Lifetime	6,078,392,035	7,489,058,174	123%

**Attachment 2-a**  
**Massachusetts Mutual Life Insurance Company**  
**Written Premium and Paid Claim Experience and Projections by Calendar Year**  
**Nationwide Experience Before Requested Rate Increase**  
**All Rate Series Combined**

	Calendar Year	Actual or Projected Experience using Current Assumptions			Cumulative Loss Ratio with interest
		A Written Premium	B Paid Claims	C = B / A Loss Ratio	D Actual (Column C) with Max. Val. Interest
Historical Experience	2000	1,878,007	0	0%	0%
	2001	11,246,947	6,991	0%	0%
	2002	25,205,413	51,876	0%	0%
	2003	43,254,196	183,242	0%	0%
	2004	65,194,437	556,089	1%	1%
	2005	95,446,960	1,114,685	1%	1%
	2006	112,124,996	1,842,521	2%	1%
	2007	126,442,943	2,631,651	2%	1%
	2008	140,392,135	3,863,131	3%	2%
	2009	149,396,364	5,685,233	4%	2%
	2010	160,788,087	7,016,165	4%	2%
	2011	176,390,918	10,100,677	6%	3%
	2012	198,045,933	13,034,548	7%	3%
	2013	200,796,989	16,349,521	8%	4%
	2014	192,626,291	20,017,393	10%	4%
	2015	180,482,789	23,989,973	13%	5%
	2016	172,575,293	28,847,827	17%	6%
	2017	165,889,663	35,128,857	21%	7%
	2018	158,637,175	45,807,056	29%	8%
	2019	156,473,222	51,304,051	33%	9%
Projected Future Experience	2020	161,939,466	49,996,016	31%	10%
	2021	163,104,080	61,280,361	38%	11%
	2022	166,969,713	81,754,198	49%	12%
	2023	170,446,978	100,726,073	59%	14%
	2024	168,757,178	116,849,042	69%	16%
	2025	164,925,128	134,376,180	81%	18%
	2026	160,679,990	154,056,639	96%	20%
	2027	156,199,932	175,922,916	113%	22%
	2028	151,544,950	200,027,607	132%	25%
	2029	146,811,872	226,473,237	154%	27%
	2030	141,922,225	255,691,180	180%	30%
	2031	136,824,000	288,078,671	211%	33%
	2032	131,436,958	323,386,937	246%	36%
	2033	125,894,797	361,210,294	287%	40%
	2034	120,100,622	401,068,962	334%	43%
	2035	114,082,045	442,266,256	388%	47%
	2036	107,925,048	483,975,587	448%	51%
	2037	101,617,816	525,345,953	517%	55%
	2038	95,198,708	565,508,857	594%	59%
	2039	88,717,766	603,492,735	680%	64%
	2040	82,216,770	638,177,342	776%	68%
	2041	75,744,051	668,554,070	883%	73%
	2042	69,361,838	693,824,948	1,000%	77%
	2043	63,123,240	713,327,401	1,130%	81%
	2044	57,077,678	726,579,253	1,273%	86%
	2045	51,273,125	733,269,255	1,430%	90%
	2046	45,752,507	733,288,585	1,603%	94%
	2047	40,551,644	726,694,772	1,792%	98%
	2048	35,697,567	713,677,873	1,999%	101%
	2049	31,210,309	694,672,184	2,226%	105%
	2050	27,101,105	670,272,236	2,473%	108%
	2051	23,372,994	641,234,734	2,743%	111%
	2052	20,019,545	608,382,985	3,039%	114%
	2053	17,030,688	572,569,113	3,362%	116%
	2054	14,391,586	534,664,967	3,715%	118%
	2055-2059	42,983,470	2,084,407,323	4,849%	126%
	2060-2064	15,677,522	1,207,761,272	7,704%	129%
	2065-2069	5,207,423	605,062,781	11,619%	131%
	2070-2074	1,624,936	266,625,727	16,408%	132%
	2075-2079	468,985	102,947,418	21,951%	132%

With Interest Accum./Disc. To 12/31/2019			
History	3,553,418,108	320,661,542	9%
Future	2,226,781,302	7,292,425,143	327%
Lifetime	5,780,199,410	7,613,086,685	132%

**Attachment 2-b**  
**Massachusetts Mutual Life Insurance Company**  
**Written Premium and Paid Claim Experience and Projections by Calendar Year**  
**Nationwide Experience After Requested Rate Increase**  
**All Rate Series Combined**

	Calendar Year	Actual or Projected Experience using Current Assumptions			Cumulative Loss Ratio with interest
		A Written Premium	B Paid Claims	C = B / A Loss Ratio	D Actual (Column C) with Max. Val. Interest
Historical Experience	2000	1,878,007	0	0%	0%
	2001	11,246,947	6,991	0%	0%
	2002	25,205,413	51,876	0%	0%
	2003	43,254,196	183,242	0%	0%
	2004	65,194,437	556,089	1%	1%
	2005	95,446,960	1,114,685	1%	1%
	2006	112,124,996	1,842,521	2%	1%
	2007	126,442,943	2,631,651	2%	1%
	2008	140,392,135	3,863,131	3%	2%
	2009	149,396,364	5,685,233	4%	2%
	2010	160,788,087	7,016,165	4%	2%
	2011	176,390,918	10,100,677	6%	3%
	2012	198,045,933	13,034,548	7%	3%
	2013	200,796,989	16,349,521	8%	4%
	2014	192,626,291	20,017,393	10%	4%
	2015	180,482,789	23,989,973	13%	5%
	2016	172,575,293	28,847,827	17%	6%
	2017	165,889,663	35,128,857	21%	7%
	2018	158,637,175	45,807,056	29%	8%
	2019	156,473,222	51,304,051	33%	9%
Projected Future Experience	2020	161,923,672	49,996,016	31%	10%
	2021	163,088,880	61,280,361	38%	11%
	2022	182,034,004	81,357,763	45%	12%
	2023	201,249,704	98,423,811	49%	14%
	2024	201,384,958	112,022,551	56%	15%
	2025	197,939,969	126,879,620	64%	17%
	2026	193,169,743	143,877,777	74%	19%
	2027	187,772,685	163,106,123	87%	21%
	2028	182,140,669	184,558,290	101%	23%
	2029	176,435,962	208,285,565	118%	25%
	2030	170,539,127	234,644,391	138%	27%
	2031	164,375,309	263,975,842	161%	30%
	2032	157,875,587	296,044,463	188%	33%
	2033	151,201,629	330,474,358	219%	36%
	2034	144,231,909	366,826,947	254%	39%
	2035	136,992,489	404,466,301	295%	42%
	2036	129,588,732	442,639,915	342%	45%
	2037	122,004,142	480,571,351	394%	49%
	2038	114,282,983	517,469,869	453%	53%
	2039	106,493,269	552,448,392	519%	56%
	2040	98,681,298	584,483,915	592%	60%
	2041	90,904,061	612,649,624	674%	64%
	2042	83,238,037	636,210,233	764%	68%
	2043	75,746,162	654,549,071	864%	71%
	2044	68,487,246	667,214,885	974%	75%
	2045	61,518,628	673,908,144	1,095%	79%
	2046	54,891,710	674,510,444	1,229%	82%
	2047	48,649,410	669,050,462	1,375%	85%
	2048	42,824,029	657,680,476	1,536%	89%
	2049	37,439,503	640,782,379	1,712%	92%
	2050	32,508,991	618,886,528	1,904%	94%
	2051	28,036,250	592,676,885	2,114%	97%
	2052	24,013,525	562,896,001	2,344%	99%
	2053	20,428,292	530,318,615	2,596%	101%
	2054	17,262,959	495,742,453	2,872%	103%
	2055-2059	51,568,166	1,938,636,383	3,759%	110%
	2060-2064	18,823,338	1,129,388,705	6,000%	113%
	2065-2069	6,264,655	568,680,785	9,078%	114%
	2070-2074	1,961,215	251,698,112	12,834%	115%
	2075-2079	567,941	97,513,273	17,170%	115%

With Interest Accum./Disc. To 12/31/2019			
History	3,553,418,108	320,661,542	9%
Future	2,591,279,601	6,742,782,229	260%
Lifetime	6,144,697,709	7,063,443,771	115%

**Attachment 3-a**  
**Massachusetts Mutual Life Insurance Company**  
**Earned Premium and Incurred Claim Experience and Projections by Calendar Year**  
**Pennsylvania-Specific Experience Before Requested Rate Increase**  
**All Rate Series Combined**

	Calendar Year	Actual or Projected Experience using Current Assumptions				Cumulative Loss Ratio with interest
		A Earned Premium	B Incurred Claims	C = B / A Incurred Loss Ratio	D End of Year Lives	E Actual (Column C) with Max. Val. Interest
Historical Experience	2000	88,042	0	0%	279	0%
	2001	946,825	0	0%	892	0%
	2002	2,067,022	2,261	0%	1,615	0%
	2003	3,184,360	0	0%	2,202	0%
	2004	4,186,682	468,113	11%	2,818	4%
	2005	5,722,880	133,151	2%	3,626	4%
	2006	6,535,819	3,578	0%	3,908	3%
	2007	7,203,420	21,563	0%	4,185	2%
	2008	8,061,174	537,842	7%	4,460	3%
	2009	8,476,849	40,729	0%	4,650	3%
	2010	9,195,187	656,873	7%	4,909	3%
	2011	9,940,465	1,187,923	12%	5,251	4%
	2012	11,109,811	1,734,383	16%	5,630	6%
	2013	11,446,545	1,015,127	9%	5,634	6%
	2014	11,214,178	3,660,211	33%	5,573	9%
	2015	10,939,018	4,888,223	45%	5,507	11%
	2016	10,666,909	2,717,288	25%	5,435	12%
	2017	10,441,384	3,206,876	31%	5,367	14%
	2018	10,193,244	5,909,963	58%	5,294	16%
	2019	10,172,424	4,792,196	47%	5,134	17%
Projected Future Experience	2020	11,120,652	6,466,942	58%	4,970	19%
	2021	11,994,664	7,511,332	63%	4,877	21%
	2022	12,442,786	8,687,231	70%	4,780	24%
	2023	12,268,629	9,952,388	81%	4,678	26%
	2024	11,987,462	11,356,715	95%	4,570	29%
	2025	11,660,562	12,893,522	111%	4,457	31%
	2026	11,352,499	14,563,534	128%	4,338	34%
	2027	11,031,498	16,373,434	148%	4,213	37%
	2028	10,689,819	18,319,851	171%	4,082	41%
	2029	10,321,546	20,391,301	198%	3,945	44%
	2030	9,954,357	22,673,030	228%	3,801	48%
	2031	9,575,434	25,153,197	263%	3,650	52%
	2032	9,180,539	27,655,492	301%	3,493	56%
	2033	8,770,181	30,164,940	344%	3,330	60%
	2034	8,343,864	32,638,232	391%	3,161	64%
	2035	7,901,873	34,971,170	443%	2,987	69%
	2036	7,447,677	37,099,636	498%	2,810	74%
	2037	6,984,812	38,974,084	558%	2,630	78%
	2038	6,515,501	40,526,348	622%	2,448	83%
	2039	6,043,145	41,702,430	690%	2,267	87%
	2040	5,571,405	42,453,293	762%	2,087	92%
	2041	5,104,507	42,716,087	837%	1,909	96%
	2042	4,646,359	42,578,939	916%	1,736	100%
	2043	4,200,952	41,971,229	999%	1,569	104%
	2044	3,772,011	41,003,636	1,087%	1,408	108%
	2045	3,363,086	39,645,667	1,179%	1,256	111%
	2046	2,977,160	37,942,510	1,274%	1,113	114%
	2047	2,616,696	35,968,536	1,375%	980	117%
	2048	2,283,347	33,732,026	1,477%	857	120%
	2049	1,978,230	31,332,947	1,584%	744	122%
	2050	1,701,701	28,815,746	1,693%	642	124%
	2051	1,453,575	26,298,242	1,809%	551	126%
	2052	1,232,674	23,783,525	1,929%	470	127%
	2053	1,037,990	21,330,045	2,055%	398	129%
	2054	868,352	18,998,942	2,188%	335	130%
	2055-2059	2,524,471	64,870,834	2,570%	1,002	134%
	2060-2064	876,998	30,171,543	3,440%	377	135%
	2065-2069	286,161	12,483,426	4,362%	137	135%
	2070-2074	95,727	4,869,861	5,087%	52	136%
	2075-2079	33,342	1,887,178	5,660%	20	136%

With Interest Accum./Disc. To 12/31/2019

History	213,516,670	37,224,859	17%
Future	155,230,195	463,049,217	298%
Lifetime	368,746,865	500,274,076	136%

**Attachment 3-b**  
**Massachusetts Mutual Life Insurance Company**  
**Earned Premium and Incurred Claim Experience and Projections by Calendar Year**  
**Pennsylvania-Specific Experience After Requested Rate Increase**  
**All Rate Series Combined**

	Calendar Year	Actual or Projected Experience using Current Assumptions				Cumulative Loss Ratio with interest
		A Earned Premium	B Incurred Claims	C = B / A Incurred Loss Ratio	D End of Year Lives	E Actual (Column C) with Max. Val. Interest
Historical Experience	2000	88,042	0	0%	279	0%
	2001	946,825	0	0%	892	0%
	2002	2,067,022	2,261	0%	1,615	0%
	2003	3,184,360	0	0%	2,202	0%
	2004	4,186,682	468,113	11%	2,818	4%
	2005	5,722,880	133,151	2%	3,626	4%
	2006	6,535,819	3,578	0%	3,908	3%
	2007	7,203,420	21,563	0%	4,185	2%
	2008	8,061,174	537,842	7%	4,460	3%
	2009	8,476,849	40,729	0%	4,650	3%
	2010	9,195,187	656,873	7%	4,909	3%
	2011	9,940,465	1,187,923	12%	5,251	4%
	2012	11,109,811	1,734,383	16%	5,630	6%
	2013	11,446,545	1,015,127	9%	5,634	6%
	2014	11,214,178	3,660,211	33%	5,573	9%
	2015	10,939,018	4,888,223	45%	5,507	11%
	2016	10,666,909	2,717,288	25%	5,435	12%
	2017	10,441,384	3,206,876	31%	5,367	14%
	2018	10,193,244	5,909,963	58%	5,294	16%
	2019	10,172,424	4,792,196	47%	5,134	17%
Projected Future Experience	2020	11,120,652	6,466,942	58%	4,970	19%
	2021	11,994,664	7,511,332	63%	4,877	21%
	2022	12,697,835	8,577,704	68%	4,670	24%
	2023	14,000,322	9,126,813	65%	4,447	26%
	2024	13,998,814	10,234,788	73%	4,343	28%
	2025	13,608,382	11,605,121	85%	4,236	30%
	2026	13,244,532	13,096,338	99%	4,123	32%
	2027	12,865,681	14,712,256	114%	4,005	35%
	2028	12,461,406	16,450,453	132%	3,880	37%
	2029	12,023,736	18,300,793	152%	3,750	40%
	2030	11,591,983	20,340,425	175%	3,614	43%
	2031	11,147,724	22,559,427	202%	3,471	47%
	2032	10,685,003	24,801,482	232%	3,322	50%
	2033	10,203,961	27,052,439	265%	3,168	53%
	2034	9,704,352	29,274,706	302%	3,008	57%
	2035	9,186,734	31,375,594	342%	2,843	61%
	2036	8,654,964	33,298,350	385%	2,675	65%
	2037	8,113,230	34,997,360	431%	2,504	69%
	2038	7,564,238	36,412,732	481%	2,332	73%
	2039	7,012,026	37,494,883	535%	2,159	76%
	2040	6,460,927	38,198,880	591%	1,988	80%
	2041	5,915,898	38,468,237	650%	1,820	84%
	2042	5,381,524	38,378,581	713%	1,656	87%
	2043	4,862,473	37,865,406	779%	1,497	91%
	2044	4,363,087	37,027,664	849%	1,344	94%
	2045	3,887,475	35,836,201	922%	1,199	97%
	2046	3,439,082	34,330,485	998%	1,063	99%
	2047	3,020,717	32,573,315	1,078%	936	102%
	2048	2,634,235	30,575,666	1,161%	819	104%
	2049	2,280,863	28,426,089	1,246%	712	106%
	2050	1,960,936	26,165,604	1,334%	615	108%
	2051	1,674,160	23,899,839	1,428%	527	109%
	2052	1,419,088	21,632,301	1,524%	450	111%
	2053	1,194,478	19,414,921	1,625%	381	112%
	2054	998,925	17,306,064	1,732%	321	113%
	2055-2059	2,902,596	59,190,013	2,039%	961	116%
	2060-2064	1,008,846	27,591,020	2,735%	362	117%
	2065-2069	330,289	11,414,644	3,456%	132	117%
	2070-2074	111,380	4,449,526	3,995%	50	118%
	2075-2079	39,449	1,724,213	4,371%	19	118%

With Interest Accum./Disc. To 12/31/2019

History	213,516,670	37,224,859	17%
Future	175,119,983	419,842,449	240%
Lifetime	388,636,653	457,067,308	118%

**Attachment 4-a**  
**Massachusetts Mutual Life Insurance Company**  
**Written Premium and Paid Claim Experience and Projections by Calendar Year**  
**Pennsylvania-Specific Experience Before Requested Rate Increase**  
**All Rate Series Combined**

	Calendar Year	Actual or Projected Experience using Current Assumptions			Cumulative Loss Ratio with interest
		A Written Premium	B Paid Claims	C = B / A Loss Ratio	D Actual (Column C) with Max. Val. Interest
Historical Experience	2000	324,381	0	0%	0%
	2001	1,254,529	0	0%	0%
	2002	2,482,607	0	0%	0%
	2003	3,419,447	2,317	0%	0%
	2004	4,548,868	38,397	1%	0%
	2005	5,977,001	118,167	2%	1%
	2006	6,773,443	146,728	2%	1%
	2007	7,430,633	131,898	2%	1%
	2008	8,206,107	118,471	1%	1%
	2009	8,744,973	169,192	2%	1%
	2010	9,420,888	220,774	2%	2%
	2011	10,252,424	335,875	3%	2%
	2012	11,377,258	565,819	5%	2%
	2013	11,320,169	725,736	6%	3%
	2014	11,145,038	1,402,743	13%	3%
	2015	10,872,571	1,709,118	16%	4%
	2016	10,554,745	2,055,790	19%	5%
	2017	10,389,109	2,408,750	23%	6%
	2018	10,128,067	3,288,833	32%	8%
	2019	10,310,637	4,025,059	39%	9%
Projected Future Experience	2020	11,382,545	3,769,793	33%	10%
	2021	12,217,291	4,644,974	38%	12%
	2022	12,429,165	6,219,844	50%	13%
	2023	12,197,714	7,686,904	63%	15%
	2024	11,895,096	8,910,289	75%	18%
	2025	11,570,626	10,181,536	88%	20%
	2026	11,256,469	11,598,833	103%	22%
	2027	10,940,150	13,157,169	120%	25%
	2028	10,583,283	14,845,032	140%	28%
	2029	10,218,334	16,663,924	163%	30%
	2030	9,846,700	18,635,767	189%	34%
	2031	9,462,476	20,780,513	220%	37%
	2032	9,061,995	23,071,209	255%	40%
	2033	8,646,465	25,471,878	295%	44%
	2034	8,215,422	27,942,828	340%	48%
	2035	7,769,121	30,430,869	392%	52%
	2036	7,311,575	32,876,293	450%	56%
	2037	6,846,300	35,217,860	514%	60%
	2038	6,375,669	37,391,958	586%	64%
	2039	5,903,066	39,335,364	666%	69%
	2040	5,432,351	40,985,123	754%	73%
	2041	4,967,663	42,280,508	851%	77%
	2042	4,513,092	43,191,970	957%	82%
	2043	4,072,264	43,688,119	1,073%	86%
	2044	3,649,143	43,768,832	1,199%	90%
	2045	3,246,786	43,434,605	1,338%	93%
	2046	2,868,331	42,696,659	1,489%	97%
	2047	2,515,833	41,578,740	1,653%	100%
	2048	2,190,787	40,107,444	1,831%	103%
	2049	1,894,122	38,327,159	2,023%	106%
	2050	1,626,104	36,291,558	2,232%	109%
	2051	1,386,153	34,065,819	2,458%	111%
	2052	1,173,074	31,705,411	2,703%	113%
	2053	985,895	29,263,833	2,968%	115%
	2054	823,196	26,798,573	3,255%	117%
	2055-2059	2,382,690	98,913,294	4,151%	122%
	2060-2064	824,492	52,275,018	6,340%	125%
	2065-2069	269,882	24,384,415	9,035%	126%
	2070-2074	90,543	10,490,733	11,586%	126%
	2075-2079	31,247	4,295,659	13,748%	126%

With Interest Accum./Disc. To 12/31/2019			
History	219,406,331	20,412,355	9%
Future	153,958,158	450,351,861	293%
Lifetime	373,364,489	470,764,216	126%



**Attachment 4-b**  
**Massachusetts Mutual Life Insurance Company**  
**Written Premium and Paid Claim Experience and Projections by Calendar Year**  
**Pennsylvania-Specific Experience After Requested Rate Increase**  
**All Rate Series Combined**

	Calendar Year	Actual or Projected Experience using Current Assumptions			Cumulative Loss Ratio with interest
		A Written Premium	B Paid Claims	C = B / A Loss Ratio	D Actual (Column C) with Max. Val. Interest
Historical Experience	2000	324,381	0	0%	0%
	2001	1,254,529	0	0%	0%
	2002	2,482,607	0	0%	0%
	2003	3,419,447	2,317	0%	0%
	2004	4,548,868	38,397	1%	0%
	2005	5,977,001	118,167	2%	1%
	2006	6,773,443	146,728	2%	1%
	2007	7,430,633	131,898	2%	1%
	2008	8,206,107	118,471	1%	1%
	2009	8,744,973	169,192	2%	1%
	2010	9,420,888	220,774	2%	2%
	2011	10,252,424	335,875	3%	2%
	2012	11,377,258	565,819	5%	2%
	2013	11,320,169	725,736	6%	3%
	2014	11,145,038	1,402,743	13%	3%
	2015	10,872,571	1,709,118	16%	4%
	2016	10,554,745	2,055,790	19%	5%
	2017	10,389,109	2,408,750	23%	6%
	2018	10,128,067	3,288,833	32%	8%
	2019	10,310,637	4,025,059	39%	9%
Projected Future Experience	2020	11,380,992	3,769,793	33%	10%
	2021	12,215,693	4,644,974	38%	12%
	2022	13,088,251	6,194,941	47%	13%
	2023	14,136,388	7,464,112	53%	15%
	2024	13,887,851	8,429,362	61%	17%
	2025	13,499,867	9,452,098	70%	19%
	2026	13,128,686	10,643,264	81%	21%
	2027	12,757,409	11,984,089	94%	23%
	2028	12,333,408	13,453,634	109%	26%
	2029	11,901,427	15,052,578	126%	28%
	2030	11,464,850	16,796,381	147%	31%
	2031	11,014,522	18,700,320	170%	33%
	2032	10,545,352	20,740,104	197%	36%
	2033	10,058,347	22,883,365	228%	39%
	2034	9,553,306	25,094,355	263%	43%
	2035	9,030,784	27,325,302	303%	46%
	2036	8,495,208	29,522,639	348%	49%
	2037	7,950,783	31,631,266	398%	53%
	2038	7,400,392	33,594,139	454%	57%
	2039	6,848,050	35,354,364	516%	60%
	2040	6,298,316	36,855,091	585%	64%
	2041	5,756,041	38,041,429	661%	68%
	2042	5,226,018	38,885,714	744%	71%
	2043	4,712,489	39,358,610	835%	75%
	2044	4,220,050	39,458,920	935%	78%
	2045	3,752,255	39,186,001	1,044%	81%
	2046	3,312,701	38,548,678	1,164%	84%
	2047	2,903,735	37,566,542	1,294%	87%
	2048	2,527,011	36,262,782	1,435%	90%
	2049	2,183,548	34,676,795	1,588%	92%
	2050	1,873,566	32,856,730	1,754%	94%
	2051	1,596,321	30,861,169	1,933%	96%
	2052	1,350,344	28,740,040	2,128%	98%
	2053	1,134,445	26,541,490	2,340%	100%
	2054	946,931	24,318,078	2,568%	101%
	2055-2059	2,739,627	89,860,962	3,280%	106%
	2060-2064	948,612	47,555,242	5,013%	108%
	2065-2069	311,623	22,195,939	7,123%	109%
	2070-2074	105,437	9,552,379	9,060%	109%
	2075-2079	37,047	3,912,673	10,561%	109%

With Interest Accum./Disc. To 12/31/2019			
History	219,406,331	20,412,355	9%
Future	174,094,254	409,154,858	235%
Lifetime	393,500,585	429,567,213	109%

**Attachment 5**  
**Massachusetts Mutual Life Insurance Company**  
**Expenses**

<b>Per Policy Expense</b>					
	200	300	400	500	511
Issue Age	First Year				
<45	\$200	\$260	\$200	\$625	\$651
45 to 54	\$200	\$260	\$200	\$635	\$669
55 to 59	\$200	\$260	\$200	\$650	\$703
60 to 64	\$200	\$260	\$200	\$660	\$740
65 to 69	\$200	\$260	\$200	\$780	\$880
70 to 74	\$200	\$260	\$200	\$1,140	\$1,331
75 to 79	\$200	\$260	\$200	\$1,630	\$1,960
80+	\$200	\$260	\$200	\$3,810	\$2,495
	Renewal Years				
	\$40	\$60	\$0	\$60	\$60

<b>Percent of Premium Expense*</b>				
200	300	400	500	511
First Year				
7.50%	7.50%	7.50%	19.25%	6.00%
Renewal Years				
7.50%	7.50%	7.50%	8.00%	6.00%

\* Includes premium tax

<b>Percent of Paid Claim Expense</b>				
200	300	400	500	511
N/A	N/A	7.50%	5.00%	5.00%

<b>Other Sales Expense</b>					
Policy Year	200	300	400	500*	511
1	N/A	N/A	N/A	77.35%	103.75%
2	N/A	N/A	N/A	7.86%	1.50%
3	N/A	N/A	N/A	4.16%	1.20%
4	N/A	N/A	N/A	2.41%	1.00%
5	N/A	N/A	N/A	2.41%	1.00%
6	N/A	N/A	N/A	2.41%	1.00%
7	N/A	N/A	N/A	2.41%	1.00%
8	N/A	N/A	N/A	2.41%	1.00%
9	N/A	N/A	N/A	2.41%	1.00%
10	N/A	N/A	N/A	2.41%	1.00%
11+	N/A	N/A	N/A	1.11%	0.30%

\*Captures the expense for the base policy; for premium in excess of the base (e.g., limited-pay riders), an alternative expense percentage is applied.

**Attachment 5**  
**Massachusetts Mutual Life Insurance Company**  
**Commission Schedule**

Policy Duration	200 Series							
	Issue Age							
	Lifetime-Pay				Limited-Pay			
	< 55	55 - 59	60 - 69	70+	< 55	55 - 59	60 - 69	70+
1	65%	55%	55%	45%	65%	55%	55%	45%
2 - 5	10%	10%	10%	10%	0%	0%	0%	0%
6 - 10	5%	5%	5%	5%	0%	0%	0%	0%
11+	2%	2%	2%	2%	0%	0%	0%	0%

Policy Duration	300 and 400 Series													
	Issue Age													
	Lifetime-Pay							Limited-Pay						
	< 45	45 - 49	50 - 54	55 - 59	60 - 69	70 - 79	80+	< 45	45 - 49	50 - 54	55 - 59	60 - 69	70 - 79	80+
1	70%	65%	60%	55%	50%	45%	40%	70%	65%	60%	55%	50%	45%	40%
2 - 5	6%	6%	6%	6%	6%	6%	6%	0%	0%	0%	0%	0%	0%	0%
6 - 10	3%	3%	3%	3%	3%	3%	3%	0%	0%	0%	0%	0%	0%	0%
11+	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%

Policy Duration	500* and 511 Series
1	50%
2 - 10	6%
11+	1%

\*Captures the commissions for the base policy;  
for premium in excess of the base (e.g., limited-  
pay riders), an alternative commission  
percentage is applied

**Attachment 6-a**  
**Massachusetts Mutual Life Insurance Company**  
**Breakdown of Nationwide Historical Incurred Claims and Reserve Balances**  
**All Rate Series Combined**

Incurred Year	Discounted to the Year of Incurral					Year-End Active Life Reserve <sup>[3]</sup>
	Incurred Claims <sup>[1]</sup>	Paid Claims	Disabled Life Reserve	IBNR Reserve	Total Claim Reserve <sup>[2]</sup>	
2000	0	0	0		0	
2001	64,652	64,652	0		0	
2002	524,902	524,902	0		0	
2003	1,705,214	1,705,214	0		0	
2004	1,499,223	1,499,223	0		0	
2005	6,151,316	6,038,632	112,684		112,684	
2006	3,965,336	3,805,078	160,258		160,258	
2007	9,302,543	8,937,813	364,729		364,729	
2008	9,425,421	9,267,110	158,311		158,311	
2009	14,920,550	14,096,680	823,870		823,870	
2010	18,556,754	17,294,345	1,262,410		1,262,410	
2011	18,633,752	16,938,695	1,695,057		1,695,057	
2012	22,275,241	20,438,622	1,836,620		1,836,620	
2013	24,296,952	21,634,057	2,662,896		2,662,896	
2014	35,607,782	28,769,738	6,838,044		6,838,044	
2015	44,629,852	33,674,996	10,954,856		10,954,856	
2016	39,553,195	27,885,559	11,667,636		11,667,636	
2017	55,868,775	32,812,005	23,056,770		23,056,770	
2018	57,100,691	26,812,865	30,287,826		30,287,826	
2019	69,990,110	17,245,961	52,744,149	0	52,744,149	1,951,846,716

[1] Incurred claims are the sum of paid claims, disabled life reserve, and incurred but not reported (IBNR) reserve.

[2] Claim reserve is the sum of disabled life reserve and IBNR reserve; IBNR reserve is zero as runout and claim reserve balances as of December 31, 2020 are used.

[3] Active Life Reserve is defined as interpolated terminal reserves plus unearned premium reserves.

**Attachment 6-b**  
**Massachusetts Mutual Life Insurance Company**  
**Breakdown of Pennsylvania-Specific Historical Incurred Claims and Reserve Balances**  
**All Rate Series Combined**

Incurred Year	Discounted to the Year of Incurral					Year-End Active Life Reserve <sup>[3]</sup>
	Incurred Claims <sup>[1]</sup>	Paid Claims	Disabled Life Reserve	IBNR Reserve	Total Claim Reserve <sup>[2]</sup>	
2000	0	0	0		0	
2001	0	0	0		0	
2002	2,261	2,261	0		0	
2003	0	0	0		0	
2004	468,113	468,113	0		0	
2005	133,151	133,151	0		0	
2006	3,578	3,578	0		0	
2007	21,563	21,563	0		0	
2008	537,842	537,842	0		0	
2009	40,729	40,729	0		0	
2010	656,873	656,873	0		0	
2011	1,187,923	1,079,552	108,371		108,371	
2012	1,734,383	1,537,283	197,100		197,100	
2013	1,015,127	1,015,127	0		0	
2014	3,660,211	2,957,898	702,313		702,313	
2015	4,888,223	3,227,547	1,660,676		1,660,676	
2016	2,717,288	2,090,909	626,379		626,379	
2017	3,206,876	2,202,238	1,004,638		1,004,638	
2018	5,909,963	2,843,573	3,066,390		3,066,390	
2019	4,792,196	1,337,310	3,454,886	0	3,454,886	114,126,537

[1] Incurred claims are the sum of paid claims, disabled life reserve, and incurred but not reported (IBNR) reserve.

[2] Claim reserve is the sum of disabled life reserve and IBNR reserve; IBNR reserve is zero as runout and claim reserve balances as of December 31, 2020 are used.

[3] Active Life Reserve is defined as interpolated terminal reserves plus unearned premium reserves.

**Attachment 7-a**  
**Massachusetts Mutual Life Insurance Company**  
**Nationwide Experience and Projections by Policy Year - Before Requested Rate Increase**  
**All Rate Series Combined**

Policy Year	Actual or Projected Experience using Current Assumptions				Cumulative Loss Ratio with interest
	A Earned Premium	B Incurred Claims	C = B / A Incurred Loss Ratio	D End of Year Lives	E Actual (Column C) with Max. Val. Interest
1	251,677,324	1,558,444	1%	88,883	1%
2	231,271,647	7,344,767	3%	86,309	2%
3	224,814,312	10,164,945	5%	84,381	3%
4	219,751,363	12,836,335	6%	82,840	3%
5	215,445,749	7,489,354	3%	81,598	3%
6	212,170,152	20,707,613	10%	80,541	4%
7	211,540,689	17,428,929	8%	79,541	5%
8	215,590,303	20,604,719	10%	78,702	5%
9	217,305,255	25,593,099	12%	77,762	6%
10	214,395,839	41,439,682	19%	76,818	7%
11	153,745,715	41,316,081	27%	75,902	8%
12	154,681,436	49,137,794	32%	74,964	9%
13	155,126,831	60,234,624	39%	73,959	10%
14	155,343,132	72,493,297	47%	72,821	12%
15	157,975,889	85,430,055	54%	71,615	14%
16	159,686,074	97,659,915	61%	70,327	15%
17	160,241,472	112,700,378	70%	68,844	17%
18	161,044,396	131,081,623	81%	67,219	19%
19	160,379,860	149,114,113	93%	65,560	21%
20	158,795,718	173,662,936	109%	63,905	24%
21	154,112,764	198,698,036	129%	62,257	26%
22	151,275,998	226,971,287	150%	60,588	29%
23	147,333,497	259,302,905	176%	58,852	32%
24	142,643,419	294,675,383	207%	57,019	35%
25	137,507,217	332,543,417	242%	55,087	39%
26	132,145,887	373,730,203	283%	53,052	43%
27	126,527,341	419,002,651	331%	50,916	47%
28	120,670,255	465,089,286	385%	48,681	51%
29	114,590,333	511,630,528	446%	46,352	56%
30	108,302,217	557,372,559	515%	43,938	61%
31	101,850,827	601,228,485	590%	41,452	66%
32	95,273,565	642,550,908	674%	38,910	71%
33	88,619,355	678,719,769	766%	36,330	76%
34	81,939,603	709,696,137	866%	33,732	81%
35	75,295,834	733,107,070	974%	31,137	86%
36	68,743,799	747,784,161	1,088%	28,569	91%
37	62,341,841	752,522,447	1,207%	26,050	96%
38	56,145,336	749,576,972	1,335%	23,600	101%
39	50,205,550	739,543,699	1,473%	21,240	105%
40	44,568,038	722,403,046	1,621%	18,989	110%
41	39,271,302	696,987,347	1,775%	16,861	113%
42	34,345,684	665,026,405	1,936%	14,869	117%
43	29,811,877	628,982,835	2,110%	13,023	120%
44	25,681,012	590,127,836	2,298%	11,327	123%
45	21,954,911	549,071,070	2,501%	9,785	126%
46	18,628,619	505,010,702	2,711%	8,395	128%
47	15,690,749	459,946,332	2,931%	7,156	130%
48	13,121,307	415,788,609	3,169%	6,060	132%
49	10,895,771	374,125,615	3,434%	5,099	133%
50	8,979,549	335,008,977	3,731%	4,263	135%
51-55	24,900,311	1,144,202,949	4,595%	12,441	139%
56-60	7,856,236	528,022,689	6,721%	4,355	140%
61-65	2,193,806	206,078,899	9,394%	1,351	141%
66-70	539,605	65,236,117	12,090%	375	141%
71-75	111,044	15,825,168	14,251%	94	141%
Total	6,105,057,617	19,033,589,204	312%	2,474,698	141%

**Attachment 7-b**  
**Massachusetts Mutual Life Insurance Company**  
**Nationwide Experience and Projections by Policy Year - After Requested Rate Increase**  
**All Rate Series Combined**

Policy Year	Actual or Projected Experience using Current Assumptions				Cumulative Loss Ratio with interest
	A Earned Premium	B Incurred Claims	C = B / A Incurred Loss Ratio	D End of Year Lives	E Actual (Column C) with Max. Val. Interest
1	251,677,324	1,558,444	1%	88,883	1%
2	231,271,647	7,344,767	3%	86,309	2%
3	224,814,312	10,164,945	5%	84,381	3%
4	219,751,363	12,836,335	6%	82,840	3%
5	215,458,226	7,489,298	3%	81,597	3%
6	212,241,076	20,707,293	10%	80,535	4%
7	211,722,645	17,428,052	8%	79,529	5%
8	215,906,741	20,602,834	10%	78,684	5%
9	217,923,856	25,588,206	12%	77,715	6%
10	216,033,533	41,421,988	19%	76,719	7%
11	157,537,014	41,247,707	26%	75,671	8%
12	161,877,697	48,928,930	30%	74,582	9%
13	165,002,204	59,833,977	36%	73,458	10%
14	167,623,592	71,808,160	43%	72,200	12%
15	172,296,406	84,345,072	49%	70,854	13%
16	176,110,759	95,917,066	54%	69,405	15%
17	178,905,417	110,009,822	61%	67,718	17%
18	182,337,562	126,941,619	70%	65,815	18%
19	184,770,822	142,674,366	77%	63,844	20%
20	185,615,560	164,386,787	89%	61,947	23%
21	182,284,638	186,120,371	102%	60,108	25%
22	180,424,303	210,749,303	117%	58,329	27%
23	176,540,019	239,451,990	136%	56,585	30%
24	171,175,525	271,451,545	159%	54,806	33%
25	165,039,766	306,023,603	185%	52,948	36%
26	158,580,014	343,727,113	217%	50,995	39%
27	151,805,535	385,198,421	254%	48,945	42%
28	144,742,031	427,408,809	295%	46,800	46%
29	137,417,150	470,033,589	342%	44,565	50%
30	129,844,213	511,936,570	394%	42,249	54%
31	122,079,902	552,132,057	452%	39,863	58%
32	114,168,206	590,041,093	517%	37,423	63%
33	106,168,135	623,260,606	587%	34,946	67%
34	98,141,555	651,759,046	664%	32,452	72%
35	90,162,413	673,360,977	747%	29,961	76%
36	82,297,589	686,998,280	835%	27,495	80%
37	74,616,787	691,558,713	927%	25,076	85%
38	67,186,102	689,099,926	1,026%	22,722	89%
39	60,066,651	680,167,964	1,132%	20,455	92%
40	53,312,450	664,738,864	1,247%	18,292	96%
41	46,969,082	641,722,599	1,366%	16,246	99%
42	41,072,371	612,686,049	1,492%	14,331	102%
43	35,646,510	579,879,586	1,627%	12,556	105%
44	30,704,263	544,457,949	1,773%	10,924	108%
45	26,247,435	506,976,178	1,932%	9,440	110%
46	22,269,681	466,686,746	2,096%	8,103	112%
47	18,757,117	425,428,403	2,268%	6,909	114%
48	15,685,531	384,945,765	2,454%	5,853	115%
49	13,025,270	346,699,806	2,662%	4,927	116%
50	10,735,196	310,752,781	2,895%	4,121	118%
51-55	29,778,084	1,064,344,368	3,574%	12,040	121%
56-60	9,406,279	493,612,638	5,248%	4,224	123%
61-65	2,631,680	193,531,053	7,354%	1,313	123%
66-70	647,638	61,551,355	9,504%	365	123%
71-75	133,059	15,041,245	11,304%	92	123%
Total	6,718,639,931	17,614,771,025	262%	2,429,147	123%

**Attachment 8-a**  
**Massachusetts Mutual Life Insurance Company**  
**Pennsylvania-Specific Experience and Projections by Policy Year - Before Requested Rate Increase**  
**All Rate Series Combined**

Policy Year	Actual or Projected Experience using Current Assumptions				Cumulative Loss Ratio with interest
	A	B	C = B / A	D	E
	Earned Premium	Incurred Claims	Incurred Loss Ratio	End of Year Lives	Actual (Column C) with Max. Val. Interest
1	15,090,490	2,091	0%	6,113	0%
2	12,432,555	72,638	1%	5,998	0%
3	12,179,694	7,073	0%	5,904	0%
4	11,957,087	537,863	4%	5,807	1%
5	11,733,397	53,926	0%	5,751	1%
6	11,609,531	480,088	4%	5,695	1%
7	11,470,966	584,304	5%	5,648	2%
8	11,880,503	535,718	5%	5,601	2%
9	12,083,990	826,584	7%	5,520	3%
10	11,948,738	3,662,260	31%	5,458	5%
11	10,863,380	3,942,403	36%	5,389	7%
12	10,932,700	3,883,101	36%	5,330	9%
13	10,917,716	4,146,655	38%	5,261	10%
14	10,927,303	4,373,007	40%	5,174	12%
15	11,241,041	5,207,617	46%	5,089	13%
16	11,420,245	6,225,488	55%	4,988	15%
17	11,465,933	8,525,440	74%	4,889	18%
18	11,693,323	8,649,536	74%	4,780	20%
19	11,755,555	9,891,896	84%	4,661	22%
20	11,684,500	11,754,864	101%	4,539	25%
21	11,175,452	13,456,671	120%	4,420	27%
22	10,949,689	15,371,677	140%	4,296	30%
23	10,626,745	17,517,999	165%	4,164	34%
24	10,268,661	19,835,917	193%	4,024	37%
25	9,891,197	22,276,019	225%	3,878	41%
26	9,495,823	24,899,338	262%	3,723	45%
27	9,081,502	27,759,433	306%	3,562	49%
28	8,649,004	30,622,042	354%	3,393	54%
29	8,199,543	33,459,443	408%	3,217	59%
30	7,734,941	36,213,469	468%	3,036	63%
31	7,257,820	38,773,982	534%	2,849	69%
32	6,771,481	41,082,312	607%	2,659	74%
33	6,279,683	42,967,715	684%	2,467	79%
34	5,786,708	44,467,221	768%	2,274	84%
35	5,296,927	45,414,023	857%	2,083	89%
36	4,814,895	45,741,105	950%	1,895	94%
37	4,345,277	45,396,984	1,045%	1,712	98%
38	3,892,405	44,580,624	1,145%	1,536	103%
39	3,460,331	43,352,511	1,253%	1,368	107%
40	3,052,569	41,653,257	1,365%	1,209	110%
41	2,671,893	39,488,665	1,478%	1,061	114%
42	2,320,493	36,997,671	1,594%	924	117%
43	1,999,706	34,345,006	1,718%	799	120%
44	1,710,098	31,601,320	1,848%	685	122%
45	1,451,321	28,818,985	1,986%	584	124%
46	1,222,700	25,953,451	2,123%	494	126%
47	1,022,992	23,150,545	2,263%	415	128%
48	850,170	20,511,932	2,413%	347	129%
49	702,141	18,093,369	2,577%	288	130%
50	575,970	15,901,976	2,761%	238	131%
51-55	1,590,324	52,004,451	3,270%	681	134%
56-60	518,416	22,903,067	4,418%	240	135%
61-65	163,550	9,569,745	5,851%	82	136%
66-70	51,534	3,684,357	7,149%	26	136%
71-75	15,508	1,185,707	7,646%	7	136%
Total	399,186,114	1,112,414,539	279%	172,232	136%



**Attachment 8-b**  
**Massachusetts Mutual Life Insurance Company**  
**Pennsylvania-Specific Experience and Projections by Policy Year - After Requested Rate Increase**  
**All Rate Series Combined**

Policy Year	Actual or Projected Experience using Current Assumptions				Cumulative Loss Ratio with interest
	A	B	C = B / A	D	E
	Earned Premium	Incurred Claims	Incurred Loss Ratio	End of Year Lives	Actual (Column C) with Max. Val. Interest
1	15,090,490	2,091	0%	6,113	0%
2	12,432,555	72,638	1%	5,998	0%
3	12,179,694	7,073	0%	5,904	0%
4	11,957,087	537,863	4%	5,807	1%
5	11,733,397	53,926	0%	5,751	1%
6	11,609,531	480,088	4%	5,695	1%
7	11,470,966	584,304	5%	5,648	2%
8	11,880,503	535,718	5%	5,601	2%
9	12,084,044	826,584	7%	5,520	3%
10	11,955,101	3,662,252	31%	5,457	5%
11	10,927,516	3,941,602	36%	5,382	7%
12	11,162,591	3,875,839	35%	5,312	9%
13	11,302,706	4,129,288	37%	5,235	10%
14	11,466,175	4,339,729	38%	5,139	12%
15	11,893,917	5,151,165	43%	5,042	13%
16	12,196,954	6,124,249	50%	4,928	15%
17	12,343,604	8,371,595	68%	4,816	17%
18	12,708,481	8,403,833	66%	4,678	19%
19	13,016,215	9,458,910	73%	4,523	21%
20	13,130,089	11,099,106	85%	4,374	24%
21	12,733,676	12,519,792	98%	4,234	26%
22	12,625,293	14,112,001	112%	4,090	29%
23	12,359,467	15,929,464	129%	3,954	31%
24	11,963,373	17,992,232	150%	3,822	34%
25	11,521,851	20,190,824	175%	3,682	37%
26	11,058,507	22,554,456	204%	3,536	41%
27	10,573,181	25,130,495	238%	3,382	44%
28	10,066,827	27,707,475	275%	3,222	48%
29	9,540,908	30,260,123	317%	3,055	52%
30	8,997,605	32,736,047	364%	2,882	56%
31	8,440,024	35,036,807	415%	2,705	61%
32	7,872,052	37,108,797	471%	2,525	65%
33	7,298,096	38,798,346	532%	2,342	69%
34	6,723,165	40,140,073	597%	2,160	74%
35	6,152,348	40,982,472	666%	1,978	78%
36	5,590,938	41,266,222	738%	1,800	82%
37	5,044,332	40,944,231	812%	1,626	86%
38	4,517,543	40,197,245	890%	1,459	90%
39	4,015,239	39,079,764	973%	1,299	93%
40	3,541,448	37,538,610	1,060%	1,148	96%
41	3,099,337	35,579,393	1,148%	1,007	99%
42	2,691,400	33,327,730	1,238%	877	102%
43	2,319,142	30,929,992	1,334%	758	104%
44	1,983,163	28,450,598	1,435%	651	106%
45	1,683,027	25,937,790	1,541%	555	108%
46	1,417,916	23,352,342	1,647%	469	109%
47	1,186,362	20,825,187	1,755%	395	111%
48	985,990	18,447,119	1,871%	330	112%
49	814,362	16,267,471	1,998%	274	113%
50	668,071	14,294,121	2,140%	226	114%
51-55	1,845,117	46,722,535	2,532%	648	116%
56-60	601,983	20,583,564	3,419%	229	117%
61-65	190,436	8,617,795	4,525%	78	117%
66-70	60,564	3,321,276	5,484%	25	118%
71-75	18,641	1,066,505	5,721%	7	118%
Total	432,742,995	1,009,606,750	233%	168,349	118%

**Letter of Authorization**

To: Department of Insurance

Massachusetts Mutual Life Insurance Company ("MassMutual") has entered into a service agreement with Milliman, Inc. ("Milliman") effective October 19, 2017 that includes long-term care rate filing services on our behalf. The agreement provides, in part, that Milliman is responsible for preparing and filing for approval with state insurance departments MassMutual's long-term care rate increase filings as directed by MassMutual. Milliman is also authorized to receive, on MassMutual's behalf, written and oral communication from each state department of insurance for the purpose of completing the rate increase filing process.

Please accept this letter of authorization for the purpose stated above. Should you have any questions regarding the above, please forward your comments to:

Massachusetts Mutual Life Insurance Company  
1295 State Street  
Springfield, MA 01001

A handwritten signature in black ink, appearing to read "R. Fawthrop", written over a horizontal line.

Roland Fawthrop  
Actuary, and Head of Health Product Management  
Massachusetts Mutual Life Insurance Company

January 4, 2021  
Date



**Please read this letter carefully and in its entirety. It contains important information about your long term care insurance policy.** Using the contact information at the end of this letter, you may contact your financial professional or our Long Term Care Administrative Office with any questions regarding this letter or your long term care insurance coverage.

[Date]

[Policyowner Name]  
[Joint Policyowner Name]  
[Address]  
[City], [State] [Zip]

**RE: Notice of a Premium Increase to your Long Term Care Insurance Policy #[AA-XXXXXXX] issued on [MM/DD/CCYY] in your Contract State of [Contract State]**

**Decision required by the Policy Anniversary Date: [MM/DD/CCYY]**

Dear [Policyowner Name],

MassMutual's purpose is to help people secure their future and protect the ones they love. One way in which we do this is by offering long term care insurance and ensuring that long term care insurance benefits will be available when our policyowners need them.

Your long term care insurance policy is an important component of your plans to help you maintain your financial independence and standard of living throughout your lifetime. When you purchased your policy, you made a wise decision to plan ahead so that you have options for your long term care needs if and when you may need them.

After a careful and thorough assessment, we have made the difficult decision to increase premium rates on many of our existing long term care insurance policies. To help you understand the need for this increase, please be aware that many factors have changed over the years that have impacted the pricing of long term care insurance policies. For example, the cost of long term care services continues to increase and today, people are living longer and the need for long term care is growing rapidly. Due to these types of changes, we now expect to pay higher amounts of benefits than had been originally anticipated. This anticipated increase in expected benefits has led to the need for us to increase premium rates.

It is important to know that no individual or policy has been singled out due to a change in the insured's age, health, claims history, or any other individual characteristic.

**Massachusetts Mutual Life Insurance Company**  
Long Term Care Administrative Office  
21600 Oxnard Street, Suite 1500 • Mailing Address: Post Office Box 4243  
Woodland Hills, CA 91365-4243  
(888) 505-0394 • Fax (818) 867-2503



As is common in the long term care insurance industry, MassMutual long term care insurance policies are guaranteed renewable. This means as long as you pay your premium, we cannot cancel or refuse to renew your policy, but we may increase premium rates. The regulatory process to implement a premium rate increase has been completed in your Contract State, and as a result, your policy is among others being impacted.

We understand that a premium increase may be difficult, and we are committed to helping you understand your options so that you can make the best decision for your personal situation.

### About this increase

The following grid provides information on your current (as of the Policy Anniversary Date) long term care insurance policy and details regarding the change to your policy's premium:

Benefit Period	[Lifetime]
Daily Benefit Amount	[\$9,999.99]
Elimination Period	[90 days]
Inflation Protection	[None]
Your Old [Mode] Premium	[\$999.99]
Your New [Mode] Premium	[\$999.99]
Percentage Increase in Premium	[999.9%]
Effective Date of New Premium	[MM/DD/CCYY] (Policy Anniversary Date)

[IMPORTANT NOTICE REGARDING WAIVER OF PREMIUM: Your premium will increase on the Policy Anniversary Date of [MM/DD/CCYY] even while your policy's premium is being waived. Your current coverage will continue and your increased premium will continue to be waived.]

### Understanding your options

You always have the option to continue your current coverage at the new premium.

However, there may be several options available to you that will reduce your policy's premium, such as:

- **Reduce the Benefit Period (BP).** Reducing the BP will reduce the maximum length of time the policy will pay benefits and the total amount of benefits payable under your policy. Any daily, weekly, monthly or annual benefit limits would continue to apply.
- **Reduce the maximum Daily Benefit Amount (DBA).** Reducing the maximum DBA will reduce the maximum amount the policy will pay for covered expenses per day and the total amount of benefits payable under your policy. This will also reduce any weekly, monthly or annual benefit amount limits available on the policy.

- **Extend the Elimination Period (EP).** Extending the EP increases the length of time you will be responsible for paying for long term care services before we will begin paying benefits.
- **Remove or reduce optional riders.** Removing or reducing an optional rider will mean you will no longer have or be eligible for the features and benefits that the rider provides. The following riders are attached to your policy:
  - [Rider Name 1][none]
  - [[Rider Name 2]
  - [Rider Name 3]]

[Removing or reducing an inflation protection rider may impact future eligibility under your Contract State's partnership program.]

[Removing or reducing benefits and/or riders may impact any covered partner benefit.]

[You should consider the number of remaining premium payments on your policy before reducing your benefits.]

Each option should be viewed in light of your individual needs and financial situation. By reducing the policy's benefits, you reduce the coverage available to pay for future care. You may not be able to increase your benefits at a later time, even if you offer to pay the increased premium amount.

A Personalized Options Election Form and Instructions are being provided to you in this package, which outline the above options for reducing your coverage and the impact on your premium. We recommend you review all options available to you, including paying the increased premium, with trusted family members, your financial professional and/or a member of our Long Term Care Administrative Office to help you determine the approach that is most appropriate for your needs.

You may also wish to contact the State Health Insurance Assistance Program (SHIP) located in your state, or the State Department/Bureau of Insurance if you need additional counseling to help determine how to proceed. Please go to [www.shiptacenter.org](http://www.shiptacenter.org) to find the nearest SHIP to you or [http://naic.org/state\\_web\\_map.htm](http://naic.org/state_web_map.htm) for information on how to contact your State Department/Bureau of Insurance.

### **Possible future changes**

It is possible that rates could increase again in the future. If they do, we will plan to follow a similar notification process.

### **What you need to do**

1. **If you want to keep your current coverage, simply pay your policy's new [mode] premium by the Policy Anniversary Date of [MM/DD/CCYY]. We do not need to**

hear from you, and you do not need to return the Personalized Options Election Form.

2. If you want to change your current coverage, complete and return the enclosed Personalized Options Election Form or otherwise submit your change request in writing by the Policy Anniversary Date of [MM/DD/CCYY].
3. If you decide not to continue coverage, complete and return the Personalized Options Election Form to choose the [Contingent Benefit Upon Lapse option] [Nonforfeiture Rider].

[Note: If we do not hear from you and you do not pay the new premium, your coverage will continue under the terms of your Nonforfeiture Rider for lapse due to non-payment of premium.]

[Note: If we do not hear from you and you do not pay the new premium, your policy will lapse due to non-payment of premium. If applicable, the Contingent Benefit Upon Lapse option outlined later in this packet will automatically be provided to you.]

[IMPORTANT NOTE ABOUT BILLING: If we do not hear from you at least 50 days prior to the Policy Anniversary Date of [MM/DD/CCYY], your next bill will reflect the new premium based on your current coverage. However, as long as we receive your request to change coverage by the Policy Anniversary Date of [MM/DD/CCYY], we will process your request effective as of that date, notify you of the new premium due, and refund excess premium paid, if any.]

If your payment is made via a third-party account or online banking, please make appropriate arrangements to revise the payment amount.]

[IMPORTANT NOTE ABOUT PRE-AUTHORIZED CHECKING (PAC) WITHDRAWALS: As long as we receive your request to change coverage by your Policy Anniversary Date of [MM/DD/CCYY], we will process your request effective as of that date, notify you of the premium amount for your next monthly PAC withdrawal and refund excess premium paid, if any.]

The need for care can be one of the most significant challenges a person can face, both personally and financially. We have seen the difference that long term care insurance coverage has made in the lives of our customers and their family members. Although the cost for this insurance is increasing, it provides valuable coverage that may not be available from health insurance or government programs.

We recommend that you carefully review all the options available to you (including paying the rate increase and considering any available benefit reduction options) with trusted family members, a financial professional and/or a member of our Long Term Care Administrative Office to help you determine which option may be most appropriate.



We value your business and trust, and remain committed to helping you with your long term care needs. And we are here to help you.

Sincerely,

[Executive]

[Title]

PS: Please retain a copy of this letter with your policy for future reference.

Enclosures: Instructions, Personalized Options Election Form

cc: [Agent Name][ & ][Insured Name]

Financial Professional	Massachusetts Mutual Life Insurance Co. Long Term Care Administrative Office
[Agent Name] [Agency Name] [Agent Phone]	MassMutual Long Term Care Administrative Office 21600 Oxnard Street, Suite 1500 PO Box 4243 Woodland Hills, CA 91365  T: (888) 505-0394 Mon. - Fri., 10 AM to 8 PM ET

## **[Important Information about the Contingent Benefit Upon Lapse Option]**

If you decide not to pay the increased premiums associated with your long term care insurance policy, and your policy lapses within the 120 days following the Policy Anniversary Date of [MM/DD/CCYY], you may convert your policy to a paid-up status with reduced benefits and no future premiums will be due. Your policy must be paid to the Policy Anniversary Date in order for this benefit to be available.

Continuing your coverage beyond 120 days after the Policy Anniversary Date of [MM/DD/CCYY] voids the Contingent Benefit Upon Lapse option.

The following terms apply to this option:

- Electing this option will not increase your coverage, which means the total benefits paid under the policy will never exceed the maximum benefits that would be payable had the policy remained in premium paying status.
- Subject to the above, your [Total] Benefit Amount will be reduced to the greater of the total of premiums paid for the policy and riders or 30 times the Daily Benefit Amount on the date of policy lapse.
- Benefits will be paid subject to the daily/weekly/monthly/annual benefit limits in effect on the date of policy lapse.
- No further benefit increases will occur under an inflation protection rider, if attached to the policy.
- Other than as described above, your coverage is subject to the same policy benefit provisions, Elimination Period, limitations and exclusions, and all other provisions of the policy and riders that were in effect on the date of policy lapse.

[Your limited pay policy also offers an additional Contingent Benefit Upon Lapse option where both the [Total] Benefit Amount and Daily Benefit Amount are modified as shown in the Personalized Options Election Form.]

By exercising a Contingent Benefit Upon Lapse option, you may be significantly reducing your policy benefits. Therefore, careful consideration is strongly recommended. ]

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## Instructions to complete the Personalized Options Election Form

The Personalized Options Election Form in this package outlines options available to you if you would like to explore adjusting your long term care insurance policy's new premium amount by reducing or removing benefits.

- This form may not include all options available to you. Additionally, options may not be of equal value and some options can reduce the new premium by more than others.
- Please review this form carefully on your own, with trusted family members, your financial professional and/or a member of our Long Term Care Administrative Office to help you determine which option may be most appropriate.
- To make changes to your policy, this form must be received in our long term care administrative office no later than the Policy Anniversary Date of [MM/DD/CCYY].
- Once we've processed the change you elected, we will send you a confirmation letter along with new policy specification pages to keep with your policy.
- **All policy change requests must be received in writing.**



## Personalized Options Election Form

Please return no later than the Policy Anniversary Date: [MM/DD/CCYY]

Prepared for: [Policyowner Name] [ & Joint Policyowner Name]  
MassMutual Long Term Care Insurance Policy #: [AA-XXXXXXX]

**IMPORTANT: You can only choose one election on this form.** The new premium amounts shown are based on only one change taking effect on the Policy Anniversary Date of [MM/DD/CCYY].

If you wish to request a change to your policy not listed on this form, or a combination of changes, please call your financial professional or our Long Term Care Administrative Office using the contact information at the end of this form.

### Reduce the Benefit Period

[Current Benefit Period]	Available Options	New [Mode] Premium	Policy Change Election
[Lifetime]	[10 Year]	[\$99,999.99]	<input type="checkbox"/>
	[6 Year]	[\$99,999.99]	<input type="checkbox"/>
	[5 Year]	[\$99,999.99]	<input type="checkbox"/>
	[4 Year]	[\$99,999.99]	<input type="checkbox"/>
	[3 Year]	[\$99,999.99]	<input type="checkbox"/>
	[2 Year]	[\$99,999.99]	<input type="checkbox"/>

[Your policy is already at the minimum allowed in your state, therefore this option is not available to you.]

### Reduce the Daily Benefit Amount

[Current DBA as of [MM/DD/CCYY]]	Available Options	New [Mode] Premium	Policy Change Election
[\$9,999.99]	[\$9,999.99]	[\$99,999.99]	<input type="checkbox"/>
	[\$9,999.99]	[\$99,999.99]	<input type="checkbox"/>

[Your policy is already at the minimum allowed in your state, therefore this option is not available to you.]

### Extend the Elimination Period

[Current Elimination Period]	Available Options	New [Mode] Premium	Policy Change Election
[0 day]	[30 day]	[\$99,999.99]	<input type="checkbox"/>
	[60 day]	[\$99,999.99]	<input type="checkbox"/>
	[90 day]	[\$99,999.99]	<input type="checkbox"/>
	[180 day]	[\$99,999.99]	<input type="checkbox"/>

[Your policy is already at the maximum allowed in your state, therefore this option is not available to you.]

Massachusetts Mutual Life Insurance Company  
Long Term Care Administrative Office  
21600 Oxnard Street, Suite 1500 • Mailing Address: Post Office Box 4243  
Woodland Hills, CA 91365-4243  
(888) 505-0394 • Fax (818) 867-2503

## [Non-Forfeiture Rider] [Contingent Benefit Upon Lapse option]

[Non-Forfeiture Rider][Contingent Benefit Upon Lapse option]	Policy Change Election
<p>I want to discontinue paying premiums and convert my policy to paid-up status with reduced benefits. The [Total] Benefit Amount below is calculated based on premium and benefits paid as of [file extract date]. The Daily Benefit Amount below is as of [MM/DD/CCYY]. The actual values will be calculated based on the date of policy lapse.</p> <p>[Option 1:] The new [Total] Benefit Amount is [\$99,999.99] and the new Daily Benefit Amount is [\$9,999.99].</p> <p>[Option 2: The new [Total] Benefit Amount is [\$99,999.99] and the new Daily Benefit Amount is [\$9,999.99].]</p>	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p>

**You have up until the Policy Anniversary Date of [MM/DD/CCYY] to make or modify any changes you elect on this form. [In order to elect the Contingent Benefit Upon Lapse option, your policy must be paid to the Policy Anniversary Date.]**

By signing below, I agree that any change(s) will be effective on the Policy Anniversary Date of [MM/DD/CCYY] provided this form is received at our Long Term Care Administrative Office by that date.

**Name of Policyowner:** [Policyowner Name]  
**[Name of Joint Policyowner:** [Joint Policyowner Name]]  
**Name of Insured:** [Insured Name]  
**[Name of Joint Insured:** [Joint Insured Name]]  
**Policy #:** [Policy AA-XXXXXXXX]

**Signature of Policyowner:** \_\_\_\_\_

**Signature of Joint Policyowner:** \_\_\_\_\_  
*(if applicable)*

**Date:** \_\_\_\_\_

Please return this form using the enclosed postage-paid envelope.

Financial Professional	Massachusetts Mutual Life Insurance Co. Long Term Care Administrative Office
[Agent Name] [Agency Name] [Agent Phone]	MassMutual Long Term Care Administrative Office 21600 Oxnard Street, Suite 1500 PO Box 4243 Woodland Hills, CA 91365  T: (888) 505-0394 Mon. - Fri., 10 AM to 8 PM ET

## **Massachusetts Mutual (MassMutual) Claim Administration and Processing Documentation**

Claims are opened and closed pursuant to the terms and conditions of the Long Term Care policy at issue. In general, claims are continually reviewed during the adjudication process to determine eligibility of Chronic Illness and receipt of covered care. Claim closure is determined during the claim review process when a resolution of a matter occurs.

LifeCare Assurance Company (LifeCare) administers claims for Mass Mutual. LifeCare has a Special Investigations Unit (SIU) that investigates potential fraud matters on behalf of Mass Mutual and 13 client other companies. The SIU is staffed by an SIU Lead investigator, who reports to the LifeCare General Counsel. The SIU Lead Investigator contracts out forensic services, including surveillance, to third party vendors. Outside counsel is also periodically utilized to assist in legal efforts to recover fraudulent payments. LifeCare currently spends less than 1% of paid claims to cover these services.

The company will continue to make certain that all claims are adjudicated to the terms of the contract. A plan has been implemented that requires medical records to be obtained on all claims during the adjudication process. Also, since claims must be recertified on an annual basis, it gives us the opportunity to review the claim for eligibility. Dashboards have also been created to look for outliers that enable us to identify possible fraudulent claims.